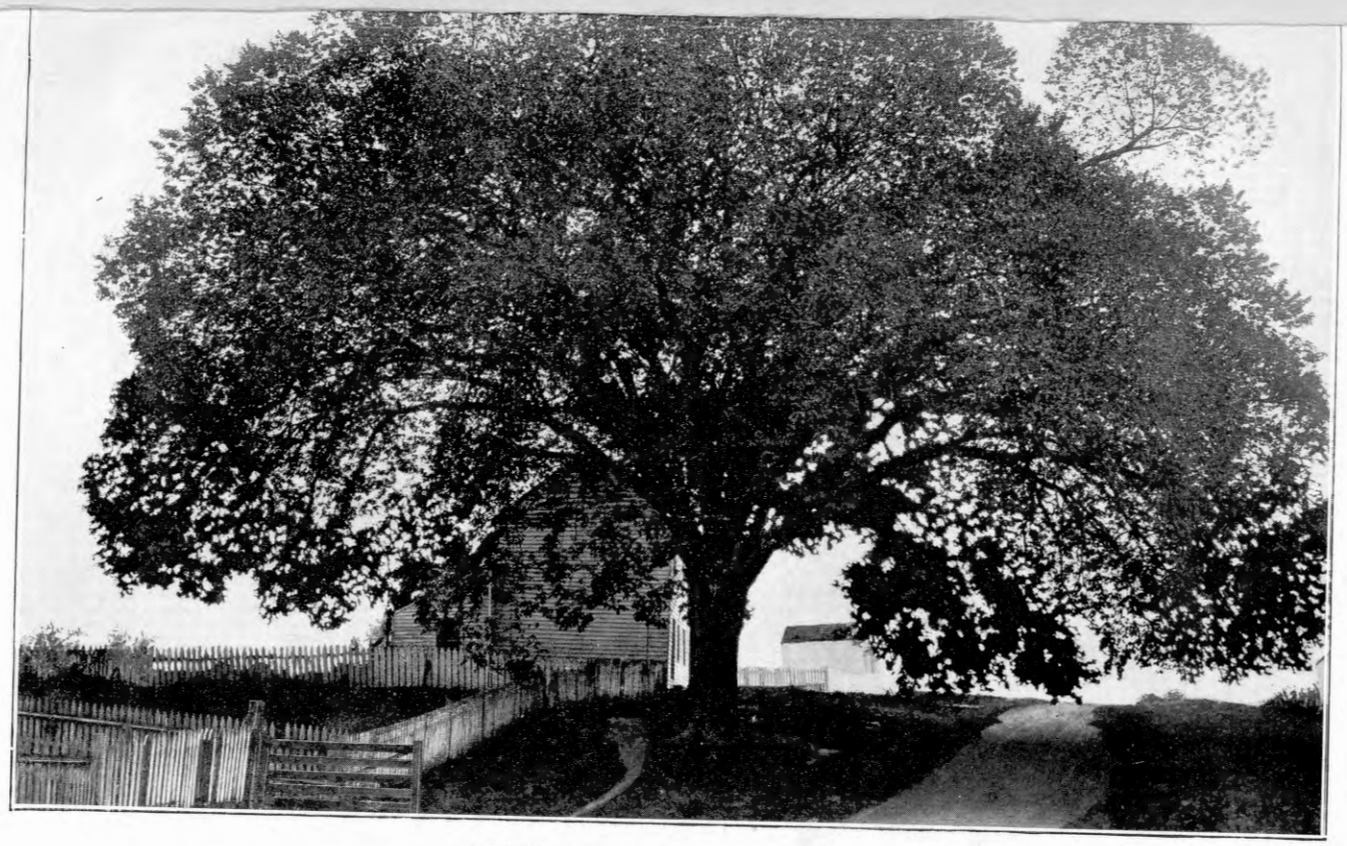


CONSTITUTION ELM AT CORYDON

Under this tree it is said the first Constitution of Indiana was adopted, on June 29, 1816. Corydon was the State's capitol until the session of January, 1824, when it was ordered to be removed to Indianapolis by June 10th, 1825.

ONE HUNDRED YEARS

OF

INDIANA'S RESOURCES

Publication No. 11

THE DEPARTMENT OF CONSERVATION

Prepared under the direction of
Richard Lieber, Director

FORT WAYNE PRINTING COMPANY
CONTRACTORS FOR INDIANA STATE PRINTING AND BINDING
FORT WAYNE, INDIANA
1920

"*Let us conserve the foundation of our prosperity*"

(Declaration of Governors, 1908)

State of Indiana
Executive Department
Indianapolis

HON. JOHN H. HOLLIDAY,
Chairman Centennial Commission,
City.

My Dear Sir:—

I am sending you, as a birthday offering to the city of Indianapolis, a booklet prepared by our State Department of Conservation, showing the development of Indiana's resources during the past hundred years, and pointing out the close connection between the measure of the resources of a great state, and the measure of the progress of its metropolis.

Indianapolis is a beautiful city and a prosperous and growing city. Situated in the center of Indiana it is typical of the progress of the Hoosier state. Its achievements are an inspiration to the entire commonwealth.

Yet let us not forget that without the support of the natural resources and the support of the people of the great state which surrounds it, the splendid record which our Capital City has made would not have been possible.

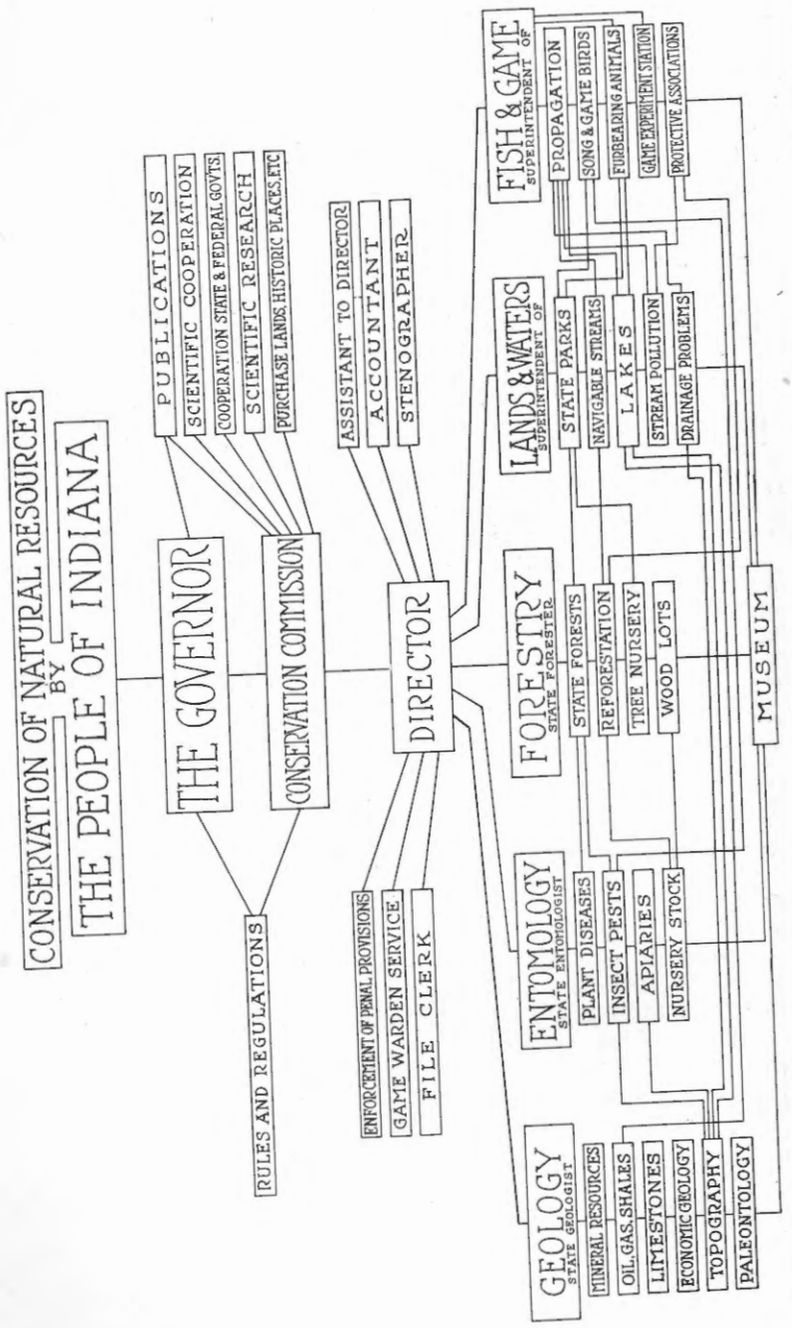
The State needs the city as an inspiration for, and a measure of its progress, and at the same time the city needs the state, not only for its material resources but for the ethical and recreative benefits which always come through contact with nature and its works.

In looking forward we are constantly reminded that the progress we have made as a state and as a city was not brought about entirely by the proper uses of our natural resources. In times bygone as a matter of self defense, it was almost necessary to destroy. But now when we know that Indiana's development is real and permanent, with our remaining resources measured and appraised by the Department of Conservation, let us develop these resources and maintain them in sustained use in order that our material and spiritual welfare may be assured for generations to come.

Very truly yours,

J. P. Goodrich

Governor



CITY, STATE AND NATION AND THEIR RELATION TO THE NATURAL RESOURCES.

By Richard Lieber, Director, The Department of Conservation

Indianapolis was a pioneer settlement. Of all of the larger cities of the country it was perhaps the last pioneer settlement; as the State itself was the last pioneer State in the Union. The sixth state in order to be admitted to the Union, it is closely followed by Illinois, but even in that state conditions did not exist that would lend it typically pioneer characteristics. Unlike the thickly wooded Hoosier land Illinois was mostly prairie and could readily be occupied without the labors attending upon the clearing of forests and cutting out of trails, nor did it have Indiana's historical background. All other states that subsequently applied followed at a time when railroads began to supercede overland movement by teams, and so we believe that out assertion is good in calling Indiana the last pioneer state and under the circumstances Indianapolis the last pioneer settlement.

Writers better qualified in that field will describe the growth of the city and give reasons for its expansion, both in size and influence. For our purpose suffice it to say that Indianapolis, as we find it today, is the product of an industrial area.

Large cities there have been in all periods of national development and it is one of the most remarkable phenomena in the history of civilization that the city itself is always the exponent of the highest development of its own time. The modern city represents a new type, not only on account of the vast masses living there, but moreover on account of its origin. Cities of antiquity were founded by order of a ruler or by representative government—the modern city, on the other hand, has not been decreed by order or planned beforehand; it has simply grown of necessity as a needed center for the expanse of industry. A modern city no longer produces things for its own or a narrowly confined consumption, but for the whole national market and not infrequently for international consumption and thus it grows to be a potent factor in international exchange of values.

It may be that the original settlement of our capital city was one of the many inexplicable accidents of fate. No one at the time of its foundation could have foreseen the trend of the future and if it was considered to make it the political center of the State as it is the geographic, not even that fact could have any bearing on the direction its development had to take thereafter. These lines were indicated by the growth and development of state and national industry.

As industry expresses the most highly developed form of human endeavor, the city has increased the betterment of the economic status in the same measure as it has sharpened the competition for its attainment. It has made higher demands on intelligence, energy and efficiency. It has been said of the city that the tempo of thinking and acting is constantly increased with the figure of population. With these increased efforts has come an elevation of the intellectual culture of the nation, so that today there can be no more doubt but that the cities are the leaders in the economical, intellectual, spiritual and artistic life of a people. But with this wonderful advantage, it is undeniably true that the city is not only the seat of dissatisfaction but also of established wrongs and evils. There is a good reason for their existence but certainly not the necessity for their everlasting endurance. As soon as we are willing to reach for the underlying cause and change or remove it we will do away with undesirable and dangerous effects. This, for instance has been done in the matter of public sanitation. The need for safe plumbing, sewers, garbage removal, etcetra, was felt in the center of population. The country would not have thought of it; there was not enough need for it, but the city realized its own insufficiency and corrected it. A city above all is not self-sufficient; it is the expression of the wealth, strength and ability of a State, but it is not the substance thereof. The further growth of the City of Indianapolis depends mainly upon two elements, the cooperation of ninety one other counties and the wealth of natural resources contained within the State. In fact, its present population was largely made up from folks who moved into it from the State and its present commanding position—inland city as it is—was attained through the disclosure and use of natural resources. It received a great impetus, for instance, by the discovery of natural gas in the eighties and it soon thereafter took good care to improve upon the situation by building up a perfect system of interstate transportation.

Transportation is the connecting bridge between the natural resources, including agriculture on the one side and human progress on the other, but in the same manner in which its growth depends on the use of natural resources for its manufacturers, so the city itself can not remain a healthy place to live in unless it be favored in its natural location and by the potency and conservation of certain indispensable resources, "A place of potency and sway o' the State." In the near future Indianapolis must decide for itself what steps it should take to guarantee its further growth, by giving careful attention to some of the most essential, albeit neglected, natural gifts.

Much of our existence, of necessity, has become artificial but such is human nature that it cannot safely detach itself from natural surroundings. In this direction, I see the significance, for instance, of state parks. They are an offset, a compensation

for unavoidable ills of the modern industrial city. With a change from an agricultural to an industrial population, the creation of these parks became increasingly pressing and it is entirely logical that their need was first felt and expressed in the larger cities. Our state parks have much to do with the comfort, the well-being-the aesthetic requirements and balance of urban population and the very presence of city parks—this admirable forward step,—points toward their need as a sanitary and hygienic factor for the material growth of the city. At the same time the City of Indianapolis in my opinion, needs more than State or City parks and when it is once clearly understood how a city after all is dependent on natural resources we will be struck with the fact that we cannot go on with our intense specialization, industrial and scientific, living in rectangular rows of brick and masonry without guaranteeing the city light, air, water and soil to draw from it those very elements of strength it needs for its continued growth.

We have seen in recent strikes how an apparently unimportant branch of operators, by their refusal to work can stop the entire system of industry or transportation. The same holds good in the operation of a city.

We have not given much attention for instance to our water supply and yet, if this water supply remains only stationery, let alone, that it should be decreased, the growth of the city would be immediately stopped and the life therein would become unbearable. Water is the basis of life. It is one of the most wonderful resources of our State but neither city nor country has properly valued it. The water table all over the State is fast receding; antiquated and ill-considered drainage schemes are lessening the quantity of this invaluable resource daily. As a matter of self-preservation, Indianapolis should take immediate steps to safeguard its future water supply. This water supply should be obtained first by preemting the water shed of the river as far, at least, as Noblesville and secondly by the building of a lake in close proximity to the city. These two factors would go a long way of supplying the city at all times with the needed water and in addition would furnish most wonderful spots for recreation and water sports.

Closely connected with the water supply is the discharge of the water used through the sewer system. The new sewage plant in building will help much to reduce to a minimum the present horrible stream pollution.

One of the greatest questions facing the nation today is that of its lumber supply. Aside from State Forests, the city ought to have a municipal forest and connected with it maintain an adequate nursery for shade trees and a botanical garden. European cities would not want to do without municipal forests and the lesson taught by French cities and towns during the recent war is one of too great an importance to be steadfastly overlooked.

Such a forest, aside from its material uses would like the lake have a wonderful influence on the well-being of the entire city.

But how could the health of the population of our great city be protected without abolishing the smoke evil. This expensive nuisance first is an astounding waste of our most valuable natural resource—namely, coal. It is an offense against public health. It makes up a serious item in the high cost of living through an excess cost of keeping clean. It is destructive to manufactured values; stocks and household goods.

In listing the opportunities and advantages of our city we must not overlook the presence of most excellent soil adapted to market gardening in close proximity to the south of our city. This, indeed, is a very great boon to us and the industrious and highly important population of market gardeners should receive the most earnest attention and assistance of the city government.

When Indianapolis was a medium sized town it could perhaps afford to neglect many of its golden opportunities. It can no longer do so and it is more than ever dependent upon our natural resources. Of these Indiana has a very great variety. The Division Chiefs of the Department of Conservation will tell us of them in the subsequent pages.

I do not know that popular attention has been called to the fact that our State is, so to speak, a miniature edition of the entire country. To begin with, it has a distinct North and South: demographically it has a northern and southern population and speech. Our Mason and Dixon Line is approximately the National Road. It has industry in the North, planting in the South. With caves and springs in the South and lakes in the North, it further carries out the comparison. The time soon will be when this great variety of delightful and even imposing scenery, having been made accessible by a system of excellent roads, will become the mecca of tourists.

After a glance backward we must now look into the future. We should make our plans and at least we can revel in the sights that we behold, although our feet, most likely, shall never walk in the realm. We are battling for the safety and contentment of coming generations. Not standing armies nor imposing navies will guarantee national strength: that country will be the leader of all, which possesses natural resources in greatest abundance; primarily coal and iron. How fortunately are we not situated in Indiana, that on the face of our own natural resources we are practically self sustaining. How essential is it that we should protect ourselves by protecting these great gifts of nature and not only those who like water or beautiful lakes, rivers and springs of the State, not only coal and oil—that shockingly abused present of Omnipotence, not only our valuable building stones, the clays, kaolin and shales, cement deposits and others, but the very soil of the State itself. "Land is the great fundamental resource of the nation," says Van Hise, "It is indeed more important than all other resources. From the land comes our food and clothing;

the surface layer of soil manufactured by the progress of nature through millions of years is the most precious natural resource of the Nation. Of all of our gifts to our descendants, that of maintaining the soil in unimpaired thickness and richness is the most serious." Are we alive to that responsibility, or why is nothing done to stave off our destructive annual floods? "The province of the prairie plains," says the same author, "is justly called 'the garden of the country.' Probably there is no other equally large area in the world which surpasses it in original fertility, and it is certain that no equally large area can be compared to it in present fertility. The strangely favored in habitants of the prairie plains (to which belong Iowa, Ohio, Illinois and Indiana), scarcely realize that only exceptionally are there large continuous areas of highly fertile soil." And yet in our own State the third highest of all in the percentage of improved lands, we have to deal with very serious questions of depletion and erosion of soil, disappearance of forests, with insect pests and loss without replacement of phosphorous. In this last item our larger cities could help out through the study and treatment of sewage which will have to include the saving of phosphorous contained therein.

The world situation makes the food question one of chief importance. At the beginning of this 20th century we have for the first time taken stock of our resources and find that they are not inexhaustible. "Moreover, the change from an apparent plethora of natural resources, free to anyone, has come upon us so suddenly that the people find themselves in a position similar to that of the youth who bequeathed a fortune, believes it far beyond his needs and draws heavily on it as his facy dictates until one day the bank refuses to cash his check. He is dazed and indignant at the new condition."

In fact the whole country is "dazed and indignant." There is no more free land to be had for the asking, no more "go west, young man." After decades of revelry in Nature's gifts, somebody woke up to the ugly realization that there is no more to "blow in," for the remainder of these sources of our prosperity has passed into the hands of circumspect individuals or corporations. Not that their stewardship is more provident but it is definitely more personal and less public than it used to be. Somebody feels that this joyride through our heritage is coming to an inglorious end owing to a lack of oil, gasoline, and water, and voices from the rear of the tonneau are beginning to enquire, "O, dear, what makes it act so queer?" or, "It always ran so smoothly and now all at once——." The Somebody in question is the American people.

This condition did not come about over night. The war did not produce it, it merely accelerated its development. It disclosed what was brewing for some time. Arthur D. Little in "Making Most of America" (Atlantic Monthly, March 1919), an essay that should be read and reread by every thinking man and woman, gives the following food for thought:

"We have land enough to allot to each individual of our population about 1750 acres with Alaska and some islands to spare. We grow 14 bushels of wheat per acre while Germany grows 28 and England 32. Of our whole potato crop of 390,000,000 bushels only 40% according to Mr. Hoover reached the market and that in a year of foreign famine and unprecedented prices at home."

"With a total annual cut of 40,000,000,000 feet, board measure of merchantable lumber another 70,000,000,000 feet are wasted in the field and at the mill."

"Enough yellow-pine pulp-wood is consumed in burners or left to rot, to make double the total tonnage of paper produced in the United States. Meanwhile our paper makers memorialize the people on the scarcity of paper stock, and pay $18.00 a cord for pulp wood which they might buy for $3.00."

"Forest fires in Minnesota in 1918 burned over an area half as large again as Massachusetts, destroying more than 25 towns, killing 400 people, and leaving 30,000 homeless."

"The flood damage on the Mississippi has exceeded $100,000,000 in single years. In 1912, 5 7097 square miles were flooded in Louisiana alone."

And so on adinfinitum.

And yet so great are our resources that withal there is no reason for discouragement let alone despair, though it becomes necessary to adjust ourselves to the new order of things. If in the process of building the nation great waste had to be endured, national maintenance from now on, demands careful and intelligent use, but fortunately we do not have to scimp.

Mr. Little points out that "of coal we possess in West Virginia alone more than Great Britain and Germany combined, but our railroads crack, as they did last winter under the burden of transporting coal, most of which might be better advantage be burned either at the mines or at centers permitting power-distribution, as electricity or gas. The widespread use of gas for power would double the effective energy of the coal, and would permit, besides by-product recovery, the saving of another billion now needlessly spent in mining and transportation. We are indeed a prodigal people, prospering for a time by methods which would end European civilization within a generation."

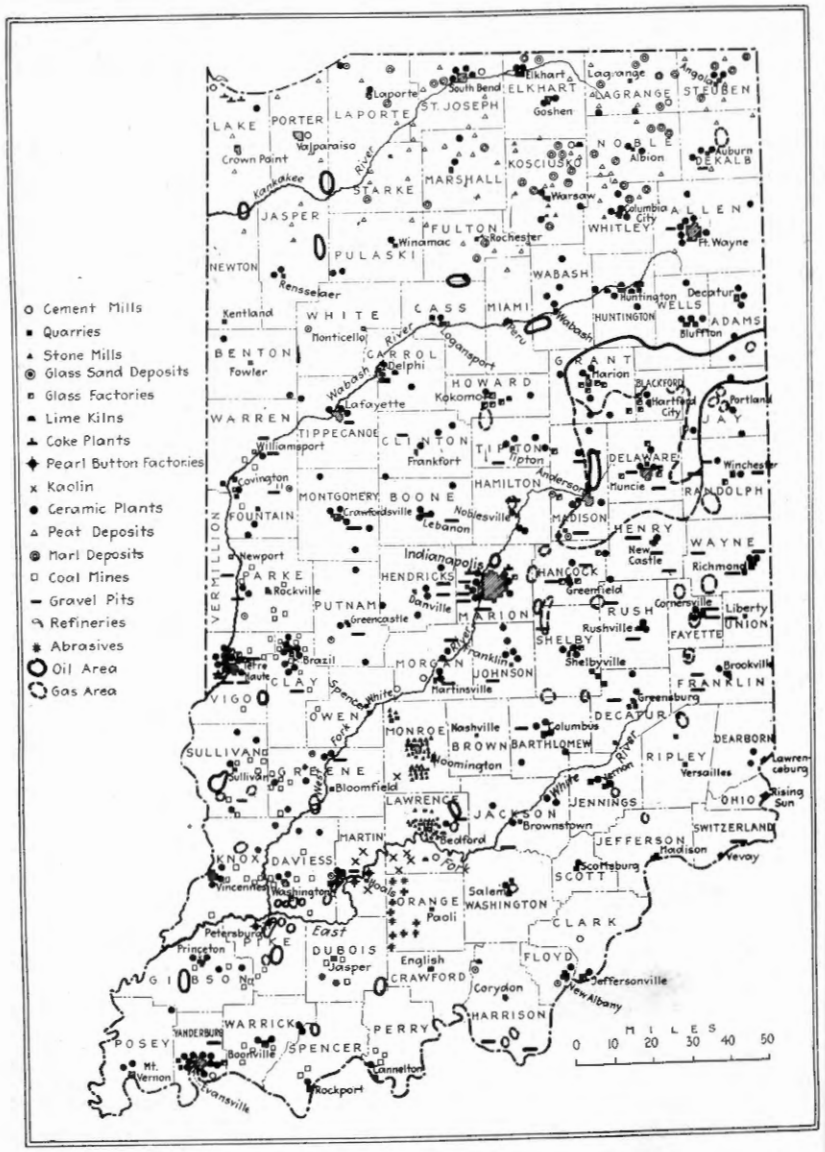
"The wastes in our petroleum industry, under which term refining is not here included, have been shocking and stupendous. Fields are abandoned with from 30 to 90% of the oil still under ground; vast areas have been ruined by admitting water into the oil sands; fires take heavy toll. In all not more than 25% of the oil under ground reaches the pipe line, and less than half of that is utilized to the best advantage.

There is needed for the conservation of our natural resources a great campaign of education. Ignorance, stupidity and greed, private and corporate must give way to enlightenment, wisdom, and service. Service above all. Conservation is not a thing serving its own ends. It seeks to serve all humanity. It aims

to maintain the health, wealth and happiness of a nation. Into a world of discordant strife it sends the rays of hope, courage and promise. Into a life of folly and injustice it carries the message of common enjoyment of common wealth. There is none so lowly but what he could enrich himself. But the lead in this campaign of education must be taken by our no longer tired business man. Let me say to him that it equals the best of life and accident insurance. Aside from obvious selfish motives it is a truly patriotic labor. Our glorious national resources will yet achieve their triumph over the spectre of mob rule. Not over embattled walls but through the open door to the enjoyment of Nature's gifts.

Unrest there always will be and fortunately so, for without it there would be no progress but decay. Unrest today is natural in a world of tempestuous and fundamental changes. But out of this time of worrying confusion and turbulence leads the way to a nobler future over the high road of humanized living conditions, in full enjoyment of the Creator's abundant gifts. Misery and hopelessness hover in darkness, joy and emprise dwell in the light; that is the difference between the Mob and a Nation.

Said Theodore Roosevelt, "Henceforth, we must seek national efficiency by a new and better way, by the way of the orderly development and use, coupled with the preservation of our natural resources; by making the most of what we have for the benefit of all of us instead of leaving the source of material prosperity open to indiscriminate exploitation. These are some of the reasons why it is wise that we should abandon the old point of view, and why conservation has become a great moral issue, and become a patriotic duty."



Map showing distribution of geological resources of Indiana

THE DIVISION OF GEOLOGY

The Mineral Resources of Indiana

By W. N. Logan, State Geologist

The history of the first quarter of the century following the founding of Indianapolis shows that only a meager attempt was made to develop the natural mineral resources of the State. Viewed from the end of the second quadrennial period we find the State occupying an important position as an iron producing state, but even at this date its fuel resources were so little known and developed that charcoal was the principal source of fuel for smelting ores. The manufacturing industry of the State was at the dawn but its dependence upon the development of fuel resources still retarded its rising to full meridianal splendor.

FUELS

The dependence of manufacturing and industrial development in general upon fuel is so circumscribed that fuel resources are of vital importance and Indiana's reserves of coal, petroleum, and natural gas place her at once in a position of great commercial and economic independence. At the present time Indiana is producing more than twenty seven millions tons of coal annually. The annual rate of increase is more than one half million tons. The coal beds of the State occupy an area of approximately seven thousand square miles in the western and southwestern portions. From one to nine beds of coal underlie the whole of sixteen counties and parts of ten others. It has been estimated that the total amount of coal included in this area approximates fifty billions tons, of which more than thirteen billons tons are recoverable under present methods of mining. More than thirty beds exist of which nine are minable over large areas.

The coals of Indiana belong to the bituminous group and in fuel value rank well among the coals of the Interior. They contain a high moisture, and volatile matter content and only a medium ash and sulphur content.

The discovery of natural gas in Indiana in 1886 led to a much more rapid expansion of the manufacturing industry of the State. The largest natural gas area lies in the eastern portion in Blackford, Delaware, Hancock, Henry, Jay, Madison and Randolph counties. Limited development of natural gas has taken place in Sullivan, Pike, Gibson, Lawrence and other counties. The peak of production was reached in 1902 when the value of the natural gas produced in Indiana exceeded seven millions of dollars. The value of the production at the present time is somewhat under one million dollars.

Shortly following the discovery of natural gas came the discovery of petroleum in the eastern Indiana field. For a time

little attention was paid to the production of petroleum, since gas was considered more desirable. But gradually the production of petroleum extended through Blackford, Delaware, Grant, Huntington, Jay, Madison and Randolph counties along the borders of the gas territory. The production of petroleum in Indiana reached its zenith in 1904 when it reached more than eleven millions of barrels, the larger part coming from the eastern field. The oil of this field is obtained from the Trenton limestone which is known to contain oil as far west as Monroe County. Oil is obtained from the Devonian (Corniferous) in the northwestern part of the State and from Mississippian and Pennsylvanian strata in the southwestern portion, including parts of Sullivan, Pike and Gibson counties. Much untested territory exists in the State and the outlook for increased production is good.

Large peat deposits occupy the sites of former lakes and ponds of glacial origin in the northern part of the State. The workable peat beds occupy about thirty-six thousand acres and contain nearly three billions cubic feet. Enormous fuel values are represented in peat which may also be used as an absorbent, packing material, deodorizer, fertilizer filler, and in the manufacture of gas, coke, and ammonia.

BUILDING MATERIALS

Next in importance to its fuel resources are the building materials of Indiana. Limestone is one of the most important of its building materials. The accessible beds of limestone of the State total more than one thousand feet in thickness. Indiana has attained an enviable position in the United States as a producer of high-grade building stone. The Indiana oolitic limestone is widely used in the erection of both public and private buildings and is deservedly praised by both architects and builders. Its uniform gray color, fineness of grain, freedom from planes of weakness and from irregularities of structure, ease of carving, strength and durability have served to recommend it to the builder for three quarters of a century. In composition it is nearly pure calcium carbonate but has a crushing strength of several thousand pounds per square inch.

Its area of outcrop extends from Putnam County to the Ohio River and varies in width from a few rods to fourteen miles. Its maximum thickness is one hundred feet. Two of the producing counties, Lawrence and Monroe, contain thirty-six large quarries which produce more than seventy per cent. of all the limestone used in the United States for building purposes. Fifty-five large mills prepare the stone for the market, handling more than ten millions of cubic feet a year. A recent order received by those mills includes enough dressed stone to fill seven hundred cars. The value of the stone for this contract is only a little under one million dollars and it all goes into a single building. The Indiana

oolitic limestone has been used in nearly every State in the Union and in foreign countries. It has been used in the erection of at least five State Capitol buildings.

The Niagara limestone is a bedded stone which is quarried extensively in Indiana and is used for flagging, curbing, foundations, ashlar, piers, abutments and other purposes. The Mitchell and other limestones are used extensively in the manufacture of macadam, concrete, lime and cement.

LIME

The lime industry in Indiana includes the manufacture of both quick and hydrated lime. The limestones used for this purpose include the Salem (Oolitic), the Mitchell and the Niagara. Both magnesian and calcium lime are produced and the production exceeds one hundred thousand tons per year. The product is used in a large number of industries, for building lime, for chemical lime, paper manufacture, sugar refining, glass manufacture, tanning and for agricultural lime.

CEMENT

The limestones and marls of Indiana are used in the manufacture of natural and Portland cements. Glacial clays, shales and slag from steel furnaces are used with the limestone in the manufacture of Portland cement in six large plants. The raw materials for the manufacture of cement in Indiana are unlimited and so distributed as to be accessible to water supply, fuel and transportation. The future of the industry is assured.

CLAY INDUSTRY

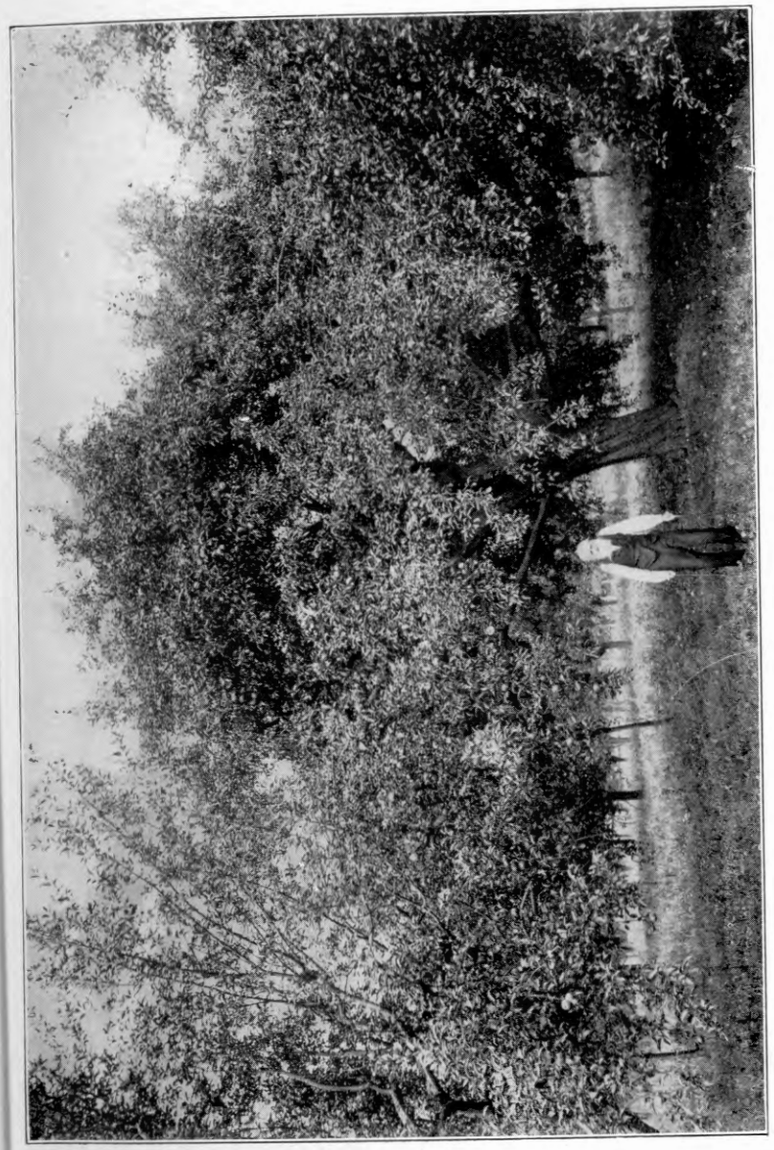
The raw materials of the ceramic industry in Indiana consist of shales from a number of geological horizons, of under clays from the coal measures, of glacial clays and kaolin. Indiana produces a large variety of ceramic wares and is the sixth State in rank in ceramic production. The annual production of common, front, vitrified, ornamental and fire brick has a value of approximately three hundred and fifty millions dollars. Drain-tile, encaustic tile, fire-proofing, terra cotta, sewer pipe and stove linings are other important clay products. Pottery products include earthenware, stone ware, yellow and Rockingham ware, white ware, C. C. ware, white granite, semi-porcelain, sanitary ware, and porcelain electrical ware. The abundance of fuel and the quality of the raw materials justify a much larger production of ceramic wares in Indiana.

OTHER MINERAL RESOURCES

Only a very brief listing of other important mineral resources of Indiana can be made in this short article. These include

building, foundry and glass sands, concrete and road materials, abrasives (oil stones, whetstones, and grinding stones) mineral waters, marl, pyrite, iron ores, oil shales, and paint pigments.

Under the proper system of conservation and development the future holds much in store for Indiana in the way of an industrial expansion based upon the utilization of her raw materials. The commercially ideal State is the one whose resources permit it to supply its own needs. The abundance and diversity of the natural resources of Indiana place her in an almost independent position, but many of these resources, at the close of a century of existence as a State, remain either dormant or only sporadically developed. Before such development will take place accurate information regarding these raw materials must be brought to those interested. As a preliminary to the presentation of such information Indiana should have a complete topographic survey of the State. The maps secured from such a survey would be of the greatest assistance to every industry using the raw materials of the State and to all of the departments of government concerned with the conservation and development of Indiana's natural resources.



THE ORIGINAL BANANA APPLE TREE
Mr. David Flory, the originator, in front of the tree

DIVISION OF ENTOMOLOGY

Frank N. Wallace, State Entomologist

When the present site of Indianapolis was chosen one of the advantages pointed out was the fact that there was a big area upon which the trees had been killed by caterpillars and it would not be so difficult to make a clearing upon which to grow crops. What a change in one hundred years. Today we spend much time and money in endeavoring to prevent insect damage to the shade trees that remain in our city. One hundred years ago we had only the insect pests which were native to this country. Today, some of our most serious insect pests are the ones we have introduced from foreign countries and the condition which was considered a help when the site of the city was chosen is now one of the serious menaces to the beauty and health of our city.

The early settlers of this part of Indiana were surprised to find that one man had visited many localities and planted apple seeds. John Chapman, better known as "Johnnie Appleseed," spent more than forty years tramping the wilderness planting apple seeds in clearings and in establishing small nurseries so that the settlers could find fruit trees in bearing when they came. He made trips to Pennsylvania to secure his seeds and some of the cider mills there saved the seeds when cider was pressed so he could have a supply ready when he came for them. He was considered crazy by some, eccentric by many, but he had real foresight and performed his mission well. A monument has been erected to his memory at Fort Wayne by the Indiana Horticultural Society. Soon after the settlers came they secured grafts of some standard varieties of apples from the east and since that time Indiana has produced apples of the finest quality.

Indeed, Indiana has made an enviable record in horticulture and much of the credit for its present status along this line belongs to the Indiana Horticultural Society. When we read the annual reports of the early meetings we get an idea of the foresight and enthusiasm of these pioneer fruit growers in Indiana horticulture. Had the fruit growers of later years heeded the advice given by some of these men more than fifty years ago, Indiana would have been the foremost state in the Union in horticulture.

The best and noblest of our fruit growers have been active in this society and every effort should be made to keep it up to the high standard set by these early members. In those days each grower apparently tried to produce better varieties of fruits and to test the new ones to see which sections were best adapted to their cultivation. At the semi-annual meetings of the society the members freely gave the results of their investigations so that others would know what varieties succeeded best.

One of their enterprises was the establishment of an experimental orchard to test varieties and to endeavor to originate

new ones. As this had served its purpose and was a heavy drain on the resources of the society it was turned over to Purdue University several years ago.

Many of the early growers endeavored to originate new varieties at home and the accompanying illustration shows the original "Winter Banana" apple tree grown by David F. Flory at Adamsboro, Cass County. This picture was taken just a few months before Mr. Flory's death. The "Winter Banana" has not been planted as heavily in Indiana as it has in the northwest but it is a favorite in some sections in the west. Mr. H. M. Widney, of St. Joe, Indiana, says it is a money-maker. One tree in his orchard produced fifty bushels of fine apples three years ago and these sold for one hundred dollars just as they were picked from the tree.

In the early reports of the Horticultural Society of Indiana we find members asking for better regulations to govern the nursery business. The substitution of worthless varieties became so common that the growers were often surprised when the trees came into bearing "true to name." This demand from the growers, coupled with the rapid spread of the San Jose scale, due to the inefficient nursery inspection laws, and methods of inspection, caused the legislature of 1907 to enact a law creating the office of State Entomologist and establishing the same at the State House in Indianapolis. Since then this law has been ammended and the Division of Apiary Inspection added. The laws were excellent and evidence of the efficient work can be seen in the hundreds of orchards which have been planted since these new laws were enacted. We do not have complaints of wholesale substitution which were so common fifteen to thirty years ago.

Nursery agents and dealers are required to secure a yearly license from this office before they are permitted to take orders or make deliveries of nursery stock. This phase of the work has been a great help in driving the crooked nursery agent out of the state. Purchasers of nursery stock should ask the agent to see his license. It is not a guarantee that he is honest but if we find he is dishonest his license will be revoked.

The Division of Apiary Inspection is placing Indiana beekeeping on a sound footing and Indiana today is one of the foremost honey-producing states. Last year the state inspectors examined more than twenty thousand colonies of bees; of this number they found one thousand eight hundred thirty-seven diseased with Foulbrood. This year the inspectors were sent to some counties where Foulbrood had been most serious and they report the districts remarkably clean. The beekeepers are showing a splendid spirit of cooperation with the Department and are making every effort to follow the instructions of the inspectors. The honey bee is one of the necessary factors in the proper pollination of Indiana fruits and the Department is

endeavoring to increase the number of hives of bees kept in the state as well as the number of pounds of honey produced. In a good season Indiana has produced four to five million pounds of honey. This is only a fractional part of the possible amount that could be produced and with better bees and better methods of keeping bees we hope soon to see Indiana producing ten million pounds of fine honey. The quality of Indiana honey cannot be surpassed.

The legislature of 1919 passed a law creating the Department of Conservation with the Entomologist's office as one of its divisions. The old laws which did not conflict with the new act were retained and the powers and duties of the office were greatly increased. At the present time we have one of the best laws in the United States and are able to handle any emergency which might arise. The "Take All" disease of last year is an illustration of how this office functions. Without the broad powers given us through the Department of Conservation, Indiana would in all probability have had all small grains quarantined by the Federal Government. Such a quarantine would have paralyzed the farming industry of the state. The office handled this situation entirely satisfactorily to the Federal Government and the farmers having the diseased wheat suffered no loss. The expense to the state was less than three thousand dollars for spraying the wheat and paying all claims. We disinfected more than twenty-five thousand bushels of wheat at the threshing machines last fall and shipped it to the U. S. Grain Corporation at New York City.

One part of our work that makes the office of the State Entomologist particularly valuable to the state is our efforts to prevent new insect pests and diseases from becoming established here. We have been able to keep the "Brown Tail" and the "Gypsy Moth" from ever gaining a foothold in Indiana. Many times these and other pests, equally as serious, have been found on nursery and greenhouse shipments, but so far we have found and destroyed them before they became established

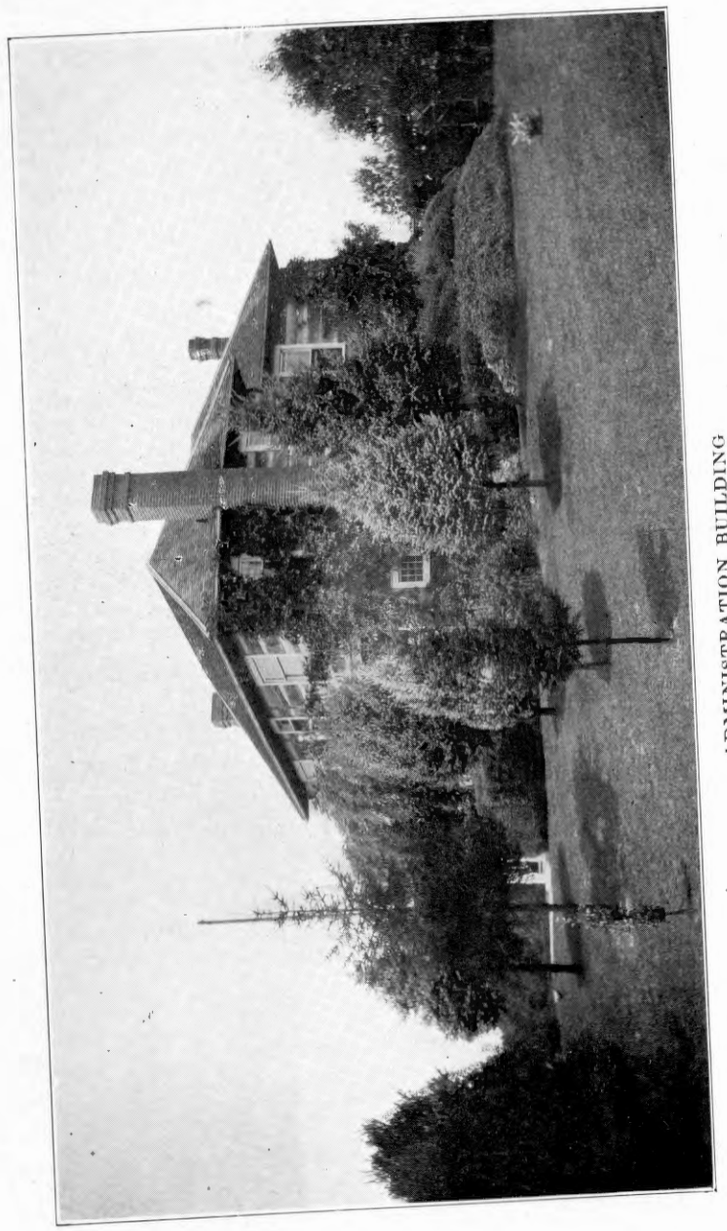
Insect pests which are established here do such an enormous amount of damage that it is almost inconceivable and the money spent in preventing others from being introduced is a splendid investment. Conservative estimates place the insect damage to our crops at more than ten percent; in many instances this runs much higher. Today the damage to the tree fruits would amount to more than fifty percent if it were not for the spraying done. We will never be able to eliminate insect damage entirely, but we are finding better methods of control and the farmers and fruit growers in Indiana are now taking a keener interest in insect control than ever before. Insect loss can and should be greatly lessened and no method of reducing it should be overlooked. The value of birds as insect destroyers is coming to be recognized by the farmers and they are giving them protection and in many instances are planting shrubbery so that the birds which build near the ground can find nesting places. Every farm in the

state should have a place where the birds can nest and have protection. This should be fenced so that cattle cannot browse on the shrubbery or tramp on the nests on the ground. It should not be too near the house, especially if that arch enemy of birds, a cat, is harbored. Bird houses and nesting boxes should be provided in the cities. The person who puts up a bird house should not be discouraged if the birds do not use it the first year. There may not be enough birds to fill them all for a few years but give them the proper conditions and they will multiply at an astonishing rate. The birds are particularly valuable because they need so many insects in the spring to feed their young, and each insect destroyed early in the season prevents hundreds from devouring the crops later.

At one time Indiana was a paradise for bird life; we had ideal conditions for them. Now, the swamps are drained and most of the underbrush is gone. This is particularly true of the central part of the state. The southern part, among the hills, has better nesting ground for birds and it is quite noticeable that insect outbreaks in those sections seldom assume the seriousness that they do in the sections where all the ground is cleared and tilled.

Most of the beautiful trees of one hundred years ago are gone and this city and the state of Indiana will depend upon the present generation for big trees when the next Centennial of this city is celebrated. We should all realize that "a beautiful tree is a gift of the preceeding generation" and that each of us can leave a living memorial that will be continually growing in grace and beauty as the years pass.

WILL YOU PLANT A TREE?



ADMINISTRATION BUILDING
Clark County State Forest

DIVISION OF FORESTRY

The Forests of Indiana, Past, Present and Future

By Charles C. Deam, State Forester

The forests serve different races of people, and the same race of people in different periods of time in different ways and in varying measures. The forests gave our arboreal ancestor all his food and practically all his shelter. The American Indian is the first race of men of whom we have an accurate knowledge of their mode of living. The forests directly or indirectly gave the Indian within the Territory of Indiana his shelter. As is well known, agriculture as practiced by the Indians was limited, and he grew in limited quantities only corn, beans, squashes and tobacco. The products of the forest, such as nuts, berries, roots and herbage, together with the rewards of hunting and fishing furnished the greater part of his food. The profound influence of the forest on this race of people is seen in their idea of immortality. Their conception of the Great Beyond was a well stocked forest which they called "The Happy Hunting Ground."

When the European, who is less nomadic and who is strictly an agriculturalist, came to Indiana he found his potential fields covered with gigantic forest trees. Before he could enter upon his mode of life, it was necesasry for him to have cleared fields, so he deadened great areas of forest trees, which, as soon as they were dry enough to burn, were felled and burned. True, the forests furnished trees for his block house, log stable, rails for his fences, and his fuel, but these requirements had little effect in diminishing the forest area.

The extreme fertility of the soil attracted the relatives and friends of the first settlers which displaced the Indians until in 1832 when the last holdings of the Indians except the Miami Reserve were ceded to the U. S. by the Treaty of Tippecanoe. Then settlement rapidly followed and magnificent forest areas were cut and burned to obtain more arable land.

When the first railroads were extended into Indiana from the east, a new epoch of forest destruction began. Up to this time the forests were cut only to make room for more cleared fields. Now since there was a market for timber in the eastern States and in European countries, trees had an intrinsic value. This gave a new impetus to settlement and commercial lumbering began. People soon learned that they could enter or buy a tract of land, sell off enough timber to erect a house and barn and to pay for the land. Saw mills were soon built every few miles along the railroads. It was soon learned that Indiana white oak, black walnut, yellow poplar, etc., were the best of their kind in the world. This reputation stimulated the demand so that the whole State was soon a network of railroads, carry-

ing off our precious natural resource. The forests were converted into improved farms, which in turn built up many prosperous towns and cities. For years lumbering was the second industry of the State. The richness and early conversion of our forest resource soon placed Indiana among the leading States of the Union. Today we pride ourselves as being one of the richest agricultural States with a population of over three million people. Whence this prosperity? Is it real wealth we have produced or is it only the conversion of our patrimony? The assessed value of Indiana is about one and a half billion dollars. What has it cost? It has been obtained at a sacrifice of practically all of our forest resources. At the present value of timber, the virgin forests of Indiana would be worth five times the total wealth of Indiana. Add to this millions of dollars of oil and gas which is a greatly diminished natural resource. Again add millions of dollars of stone, and coal that have been mined; and last add at least a billion dollars worth of soil fertility that has been lost. What of the next centennial inventory? During the century of our existence we have spent the rich endowments nature gave us. The next generations will not have our resources. Are we planning to bequeath something to the people of the next century? Will they expect it? Can they rightly do so? The march of progress and civilization should be headed by the banner of justice. Since we have wantonly spent all of our forest resources, is it not right that we should provide at least in some considerable measure for a future timber supply?

To intelligently consider this question let us ascertain what are the real forest conditions in Indiana today. Out of an acreage of over twenty-two million acres there are not over two millions of reasonably good woodland remaining. The cut of this area would not equal the cut of 50,000 acres of virgin forest land. The woodland area is distributed throughout the State and consists of small tracts. The forests of the rich agricultural parts of the State seemed to be doomed to extinction on account of the great demand for arable land. The greatest amount of forest land is in the hilly counties or on the roughest ground—areas that are too hilly, steep or rocky to be profitably farmed. It is a well known fact that when a steep slope is cleared and farmed that the soil gradually washes off, and in time becomes unproductive, and is abandoned. This fact is exemplified by possibly a half million acres in southern Indiana that have helped to enrich the delta of the Mississippi River by millions of tons of fertile soil, made so by centuries of forest cover. A concrete example will give a better idea of soil erosion and its consequence. The writer in passing through Harrison County a few years ago saw a man plowing for wheat with an ox team. This interested him, and he stopped for an interview, which brought forth the following information:

The man was about 55 years old and was living on the farm on which his father settled. He lived in a large two-story frame

house which, judging from the style of architecture, was built about the time of the Civil War. The house was in a very decadent state. The barn was a tumble-down affair and fences had rotted away. Some of the fields acre abandoned. How are we to interpret this picture which is rather an extreme of thousands of others? The father had cleared the land, and sold the timber to build his house and barn. He farmed the land until his death when his son fell heir to it, and a millstone heirloom it was. It was necessary for him to place a small mortgage on the place. He could not possibly pay the mortgage. This example seems to be the logical outcome of thousands of acres now under cultivation in the southern part of the State. Then, too, there are thousands of acres of still rougher land that are still thinly wooded, which are in the process of being cleared.

The last epoch of forest destruction began a few years ago when the increased consumption of dairy products greatly advanced the price of dairy products. Today landowners are clearing their hills as fast as they can to get more grazing land, and those who cannot clear them are fencing their woodland for grazing purposes, which kills all reproduction, and it is only a question of a few years until the whole area will be laid bare for erosion.

Unfortunately Indiana has no land classification. The greater part of Indiana without question is strictly agricultural land, but there is a large acreage in the hilly counties of the southern part that is essential forest land. It should have never been cleared, and to prevent it from being washed away it should, for all time, be kept in forest, regardless of the income or the demand for forest products.

What is the physical aspect of forest conditions in Indiana today and what is the mental attitude of the people toward the forestry problem? Today the vast forest expanse of Indiana has withered to an insignificant area of second grade timber which, at the present rate of consumption would not meet our total requirements for twenty-five years. Broadly speaking, every effort is now being made to clear the remaining forests, and every condition is favorable to their extinction.

The public mind is dormant on the subject of our future timber supply. True in 1903 the State Legislature was persuaded to buy the Clark County State Forest of 2,000 acres for experimental purposes. The cost was less than one thousandth part of a cent per capita. The sale of the Turkey Run woods which was the last remnant of virgin timber in Indiana to a saw mill man so aroused a small coterie of public spirited men that with their combined influence and contributions they were able to buy it from the purchaser, and turned it over to the State for the benefit of posterity. What else has been accomplished in Indiana in the way of perpetuating a forest area? Nothing.

What of the future of Indiana forests? Will succeeding generations need wood? It seems almost puerile to ask such a

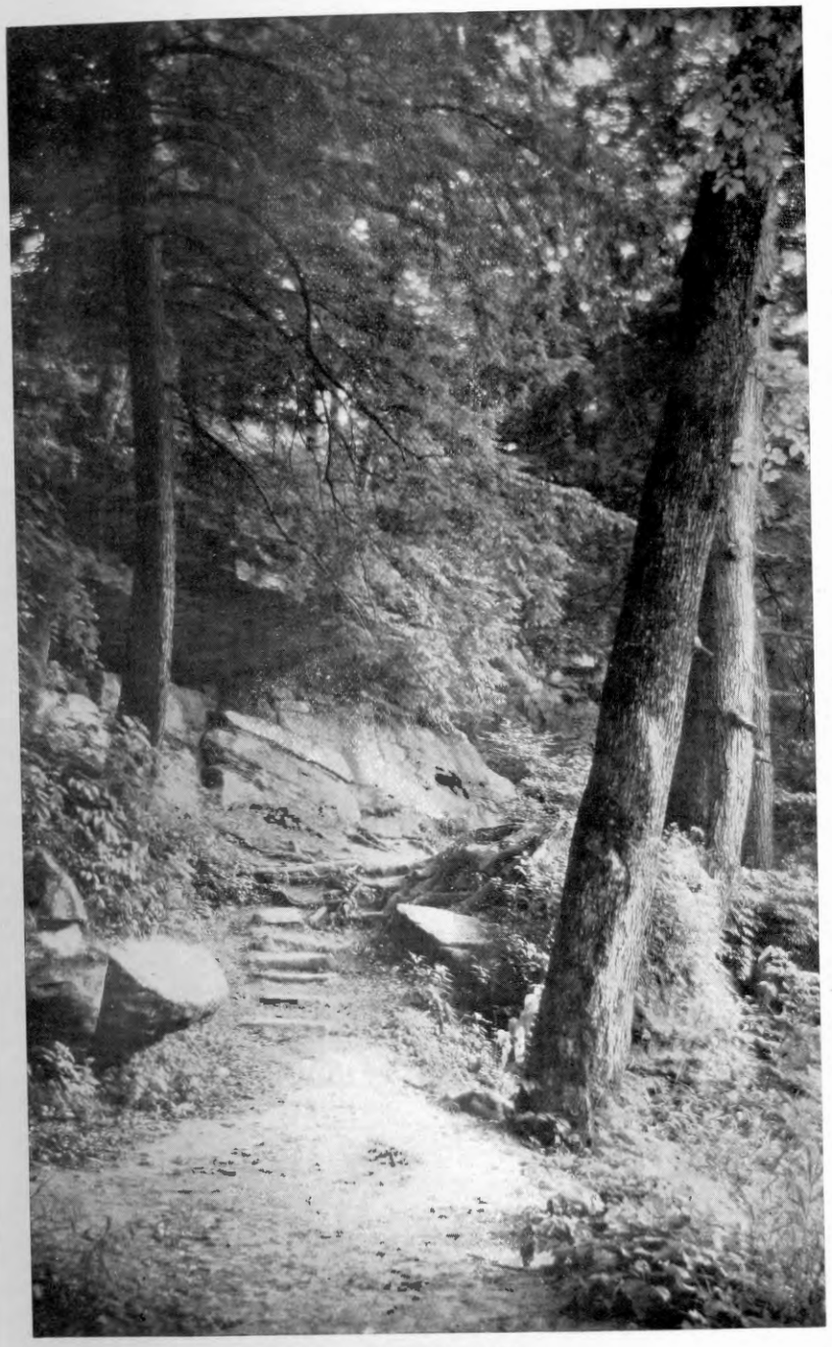
question when statistics show that the uses of wood are eve
increasing. The answer makes us tremble when statistics sho
us that the consumption of wood products are greater than pr
duction. True, steel and cement in many instances are sati
factory substitutes. They are satisfactory simply because the
are cheaper. However, we should be mindful of the fact tha
the cheapness of these substitutes depends upon the preser
abundance and cheapness of coal which will gradually becom
scarcer, and consequently higher priced.

The abundance of timber in a few foreign lands has bee
offered as an excuse for deferring action on our forestry proble
While great transportation facilities prevail, and doubtless w
increase, which will be favorable for the importation of timbe
yet the same ships will be the medium through which our co
will be carried to countries which have no coal; which seems
balance the equation.

There is no legitimate excuse for deferring action in rega
to a future timber supply. Every inference and deduction sho
that the future will need more forests than we are at prese
preparing for it. The present high price of lumber is only t
prelude of what we may expect in the future. If the generatio
of the past hundred years with a scanty population have pr
tically used all of the forests east of the Rocky Mountains, whe
will the teeming millions of the next hundred years get a fore
supply? Can the future endure a shortage without great inco
venience, or great suffering? Sentiment and justice are bo
trying to arouse the public from the stupor produced by
inherited forest riches. If we do not desert our niggardly attitu
toward this subject, we will justly receive the curses of poster
The subject of a future timber and fuel supply has b
studied by some of our foremost citizens who are in possess
of all of the facts and who are capable of forming correct ded
tions. I believe it is the consensus of opinion that the pres
forest area of the U. S. should not be diminished. A for
policy for Indiana has likewise been studied, and it is agreed th
the State should own the forests because it can more economica
manage them, and more efficiently protect them. The pres
outlook demands that the State immediately invest in st
forests. The purchase of forest lands for the State is not a gra
ity, but a wise and paying investment.

If the Baptists of Indiana, with a membership of 56,000
donate 3½ millions of dollars for the spiritual welfare of poster
certainly the whole State of Indiana could financially afford
invest a few million dollars in state forests.

Every citizen of Indiana is under moral obligations to supp
a policy looking forward to a future timber supply, and sho
see to it that his representative to the next legislature is in fa
of such a policy. Ignorance is no longer an excuse for inactiv
Our financial ability is certain. Inaction or delay is crimi
If we act now and wisely, posterity will praise us instead
cursing us.



LOVERS' LANE
Turkey Run State Park

DIVISION OF LANDS AND WATERS

By Charles G. Sauers, Acting Superintendent

STREAMS

Streams were the highways of pioneer life. When the site for Indianapolis was selected, the fact that it was on White River was one of the deciding factors. Earlier prospectors through Indiana reported the numerous rivers as one of the desirable features of the new territory. The thick woods of the region prevented any travel through them except afoot or horseback. The rivers were highways by which the pioneers entered and by which they exported their products. Although White River in Marion County never proved navigable to steamers of any size, yet it was ample for the canoes, bateaux and flatboats of the early period. Numerous efforts were made in the first twenty years to establish the navigability of White River to steamboats, but frequent ripples, sandbars and drifts and the advent of the railroads caused the attempt to be dropped.

Indiana streams were, nevertheless, a big factor in early Hoosier commerce. The legislatures from 1820 to 1835 declared about forty streams public highways. These streams were worked much the same as the roads are now, drifts were cleared and no obstruction to flatboat traffic on spring high waters was permitted. Early records state that at least a thousand flatboats were floated down the Wabash, White River and their tributaries every spring. These were loaded with pork, lard, live-stock, oats and corn. These Hoosier exports were all sent to the New Orleans market and authentic records show an annual valuation of $1,000,000.

With the advent of the railroads, and the improvement and opening up of new roads the rivers rapidly fell into disuse for transportation. They now became a source of waterpower for numerous grist and woolen mills, sand and gravel for construction purposes, a means of run-off for town and factory wastes, and a source of city water supply. From the first, the streams were a source of a considerable food supply for fish life was very abundant.

There is now taken about 2,000,000 tons of gravel and sand, annually, from the beds of streams for road and building construction. It is usually of the highest quality and this resource is invaluable to the State. Fish life has rapidly decreased with the increase in population and the industrial development which increased stream pollution. The natural propagation of fish in the streams is now annually supplemented by the product of four large fish hatcheries and with that it requires a skillful angler to secure sufficient fry for one meal.

The streams of Indiana must be restored as nearly as possible to their pristine purity and beauty. Thousands of pounds of

fish go to the Hoosier tables each year as the result of a day on a neighboring stream by the son or father. The value of the streams as an economical source of recreation is enormous. Many men who do not care for other sports or do not have the means to make extensive trips into more virgin country, fish their local streams and find not only food, but a day's recreation and a reserve of energy for the work in factory and office. The need of recreation to the city dweller has become one of the chief civic problems and fishing is one of the solutions.

Just as we have learned to keep our streets and highways free of rubbish and filth for sanitary and aesthetic reasons, so must we come to think of our streams as something other than a dumping ground. The refuse from the first factories and packing plants situated along the streams was carried away unnoticed because the volume of the stream so diluted it as to make it non-injurious and unoffensive. With the development of coal, gas, oil and other resources, Indiana has seen a rapid industrial development. The pollution of streams, by the factory wastes and sewage from the towns which were a part of the industrial growth, has steadily increased until we now find miles of our finest streams filled with putrid, acid, offensive pollution, a menace to health, the fish entirely gone and a disgrace to the commonwealth. Factory wastes must either be manufactured into a profitable by-product or be so treated that when they reach the streams they are non-injurious to public health and fish life. Upon the Department of Conservation falls the duty of preventing such pollution. The State and its industries and civic corporations must cooperate to discover the means of preventing such pollution that the streams may continue to be used as a source of water supply and a source of recreation to the thousands of citizens who require it, demand it and must have it.

The streams will, some day, be restored to their original use as highways for with the increase in population and volume of exports the railways become overburdened and the streams are cleared, dredged and drained for the use of freight carrying boats. Even now there is a well-organized movement to open up the St. Lawrence to ocean going bottoms and within this genertion we may see Michigan City a sea port where goods are loaded for the Atlantic trade. With the development of our trade with South America, New Orleans again becomes a port of shipping for Hoosier goods carried down the White and Wabash Rivers.

LAKES

The numerous lakes of Northern Indiana were the first places of settlement in that district for there was food and water. Many have been drained in the restoration of lands for agricultural purposes. There was originally at least 3,500,000 acres of swamp and lake land which was not suitable to agriculture. All but approximately 625,000 acres has been drained and developed

into rich farming country. Part of the location of the present State House was once a swamp and had to be drained. Drainage has proceeded to such an extent that laws are now necessary to prevent the total destruction of the lakes still remaining. These lakes are now the summer playground of Indiana and each summer finds the shores thickly populated with Hoosiers seeking rest, quiet, relief from the great heat of the cities and a chance to store up a reserve of energy to carry them through the year.

Through their use as summer resorts the lakes cause millions of dollars to be spent in Indiana which, ordinarily would be spent in some other State, which had similar resources. Fortunately they are situated in a region with a large industrial population which most needs the outdoors. The people who know and use the Indiana lakes year after year have organized and will ask the next legislature to place all lakes over ten acres under the control of The Department of Conservation, so that they will be preserved for the use of present and future Hoosiers. The summer population of the lakes grows annually and with the continued increase in population they will become an integral and permanent asset to the health and happiness of the commonwealth.

Further drainage of swamp lands should be undertaken with the greatest care and only after thorough investigation for the value of the lakes affected will often more than counterbalance the value of the reclaimed land. We can no longer judge them from a purely aesthetic standpoint. They are a great economic asset to the State through the attraction of the great numbers to the summer hotels and cottages. Their value as an outing place to the large industrial population is impossible to estimate. Numerous drainage laws appear in the Indiana statutes, passed in a haphazard fashion with no thought of correlation of the great drainage areas. Before the work is really effective a great amount will have to be done over. If the whole drainage problem had been attacked systematically, comprehensively and scientifically, the results would have been less expensive, more efficient and more permanent. We should certainly profit by our mistakes and work out the remainder of the problem so as to do the greatest good to the greatest number.

PARKS

All Indianapolis, all Indiana, was once a great, beautiful woodland park. *22,000,000* acres of park land practically disappeared in 100 years until there is now left a few very small areas of really virgin Indiana. The largest of these, Turkey Run, fortunately, belongs to the State. This is a reserve of about 280 acres lying in Parke County on Sugar Creek. It was purchased as a memorial of the State's centennial—1916. Here are great oak, walnut, yellow poplar and maple, centuries old and a fitting monument to our pioneer forefathers. Sugar Creek

runs for more than a mile through the park and with its tributaries has cut great canyons through limestone, from the walls of which hang festoons of mosses, ferns and lichens. This park was visited by 33,500 people during the summer of 1919 which only serves to illustrate how valuable, interesting and inspiring is this last remnant of Indiana of a century past.

In Owen County is another park of 350 acres, McCormick's Creek Canyon. It lies on both sides of a deep canyon cut into limestone by McCormick's Creek, which enters White River within the boundaries of the park. It is covered with fine second growth timber and virgin beech.

At both state parks are modern hotels and ample camping facilities. They are widely used for picnics, outings and vacations. Fishing, swimming, hiking, rest, quiet and beauty are their features. These two parks form a nucleus of a great chain of state parks which will some day circle the State, and be connected with a great state highway. Such a system would be a large natural gallery portraying primitive, historic and scenic Indiana and its great resources.

RIVERSIDE STATE FISH HATCHERY, 1920
INDIANAPOLIS, INDIANA

This hatchery consists of 26 ponds some of which are an acre in extent. It is one of the largest bass hatcheries in the United States. Large and Small-mouthed black bass, crappies and other species of fish are propagated. The small-mouthed black bass is the most expensive and difficult of our fishes to propagate. The ponds are fed from springs and a spring-fed brook.

DIVISION FISH AND GAME

By Geo. N. Mannfeld; Superintendent.

A century ago ours was one of the richest States in the Union, not alone in forests, fish and game, but in other natural resources. As one generation followed the other, they took from the forests, lakes and streams all they could seize, little thinking of how it would affect the succeeding generation. In consequence we, of this generation, have inherited a greatly reduced store of the natural resources which had been allowed to accumulate for ages and which were first made use of by the pioneers of our State.

In 1816, when the State of Indiana was admitted to the Union, the forests were full of game and the streams teeming with fish. Bears, panthers, wolves and other wild animals frequented the forests and were a menace to the children of the settlers. The Indians were still in the state, but were at peace with the whites. Beaver, otter, mink, muskrat, opossum, fox and skunk were very abundant among the fur-bearing animals, and it is said porcupines were so plentiful they became a pest. There was an immense amount of game, including deer, wild turkeys, quail, ruffed and pinnated grouse and wild pigeons. The latter is a bird now totally extinct in the United States. In those days it was not an art to catch fish or to shoot game; it was more of a necessity and insured a daily maintenance of food. The first roads of the State were traces left by the buffalo, which had left the State some time before 1810. Most of the villages were built on the banks of the streams, not alone because they contained a constant supply of food, but because they offered a means for travel and transportation, which at that time was done by canoe or flat boat.

As the villages grew in population, some of the sons of the pioneers did not take kindly to the work with the axe and plow. There were a few who preferred to hunt and fish instead of helping their folks to advance civilization. They not only hunted and fished when it was necessary, but did so all the time; in fact, they made a business of it, and so it came to pass that game and fish were brought to the villages and sold, a business which the Indians started. It is said they were paid very little for the game they killed, for one could buy three wild turkeys for a quarter, or a saddle of venison for the same price. It was a pleasant and easy way to make a living, and as these young folks were more or less good for nothing else, and had to make a living some way, they took to killing game for commercial purposes, and here unnecessary slaughter of fish and game began.

As more and more of the land was cleared, and the population of the State increased, the scarcity of game and fish became noticeable, and there was talk of passing laws to protect them. The day when a Davy Crockett or a Daniel Boone was necessary in the family had passed. Indeed, there was a time when such

a man had been very much needed, for it meant that all would have fresh meat to eat; also buckskin for moccasins and clothing, as well as feathers for pillows and bed ticks, and fur for robes and rugs to make the pioneer's home warm and cozy in the winter time.

The destruction of game had been carried on to such an extent that when the Legislature met in 1857, it thought best to pass a law to protect it. So it was made an offense to kill deer, wild turkeys, quail and grouse from the first of January to the first of August of any year. The scarcity of fish having also become noticeable, a law was passed to protect them also, but this law was not passed until ten years later, or in 1867. It provided that for two years thereafter no one should be allowed to catch fish in any manner except with a spear or with a hook and line. It also provided that after these two years, the period of closed season should be from May first to September first, and a wise law it was, but it helped little, as we shall learn later on. In 1871 the spearing of fish was prohibited in March and April in the spring, and in November and December in the fall. The pollution of streams was also made unlawful. Protection was given to birds in 1873, and in 1877, to waterfowl of certain species, which were provided with closed seasons.

Although the laws were intended to stop the slaughter of the game and fish, they did not suffice. The laws were not observed and as there had been no legal machinery provided to enforce them, fear of prosecution had no effect. This had been left to the prosecuting attorneys of the various counties, but as they did not wish to engender the ill will of their constituents they seldom, if ever, prosecuted anyone; in fact, some of them grossly violated the laws themselves. The disappearance of fish from the waters of the State became so alarming that the Legislature in 1881 thought best to have an investigation made, so it created the office of Commissioner of Fisheries, and Governor Albert G. Porter appointed Calvin I. Fletcher, of Spencer, to the position. The duties of the Commissioner were to examine the various lakes, rivers, streams and water courses in the State and to ascertain if they could not be rendered more productive. He was to report at the next session of the Legislature in 1883. An appropriation of two thousand dollars, and three hundred dollars per annum in salary was appropriated for him to carry on the work. Two years later Mr. Fletcher in making his report called attention to the wholesale violation of the fish laws going on, and that he was entreated to prosecute the violators, for which he had been given no authority. He said the most urgent need was protection, but that he favored propagation also, and for the purpose of stocking the waters, German carp be introduced. There has been much criticism of Mr. Fletcher's action in introducing carp into our waters, but much of it is unjust. It had one good effect, at least; it showed that stocking does some good. If he had restocked with fish already native to Indiana waters

he could not have proven its effect so well. Mr. Fletcher served four years. He was followed by other Commissioners, and from time to time the laws were changed, making them more severe, but not until 1897 was anything done to give the Commissioners in office power to appoint wardens to enforce the laws. In fact, for many years only the sum of one thousand dollars was appropriated for the office. The Commissioner's salary of three hundred dollars was included in this sum, and they could not afford to give much of their time and labor for so little pay. Mr. Fletcher served from 1881 to 1885. He was followed in office by the following Commissioners: Enos B. Reed, 1885-1889; W. F. Dennis, 1889-1893; Philip P. Kirsch, 1893-1897; Z. T. Sweeney, 1897-1910; George W. Miles, 1910-1915, and Eugene C. Shireman, 1915-1919. In 1899, the office of Commissioner of Fisheries was broadened, and Mr. Sweeney, then in office, was made Commissioner of Fisheries and Game, a title conferred when he was given added powers to protect game.

In April, 1919, the duties of Mr. Shireman, the last Commissioner, were transferred to the Department of Conservation, and the work is now being carried on by this Division. Under Mr. Sweeney's administration the value of birds was brought to public attention, and many progressive changes were made in the fish and game laws. Among them was one in which a resident and non-resident hunting license was created. The sale of licenses provided revenue to employ game wardens on regular salary, and he himself received an increase to twelve hundred dollars per annum, with an allowance of eight hundred dollars for expenses. While Indiana legislators were withholding their approval to legislation establishing fish culture and real protection, other states had progressed wonderfully along this line. The hatching of fish and the artificial development of their eggs had been successfully accomplished in other states. It received, however, no attention by our own. So strong became the demand from the sportsmen of the State that the work be fostered that the Marion County Fish and Game Protective Association, which had built a bass hatchery at its own expense at Indianapolis, in 1909, appealed to the Legislature that a scientific department of Fish Culture be established. The Association itself had succeeded in rearing thousands of black bass, and it soon attracted attention everywhere, and showed that the work was practical. Before long other associations began to organize for the better protection of fish and game, and they also propagated bass to stock the waters of their respective counties. Among these were the Hamilton and Wayne County Fish and Game Protective Associations. In 1911 the Indiana Fish, Game and Forest League was organized by the sportsmen. The purpose was to secure a better department. The demand was for a department free from political influences, and one in which fish culture would be made a feature. Under the old department the wardens were appointed more for their political activities

than for their qualifications and desire to make arrests. T
League's appeal was not listened to however, but the duti
of the Commissioner were broadened by giving him power
propagate fish. A law requiring non-residents to take out
license to fish in the State was passed instead, and Mr. Mile
who was then Commissioner, began to establish fish hatcheries f
the State. An increase in the Commissioner's salary was al
made in this year. His previous salary of twelve hundred dolla
per annum, and eight hundred dollars, for expenses was increas
to a salary of three thousand dollars and eight hundred dolla
for expenses. In the next few years to follow the Commission
built fish hatcheries at Tri-Lakes and at Lake Wawasee, and t
work was later augmented by hatcheries at Brookville and Ba
Lake. In 1917, during Mr. Shireman's term as Commission
a hatchery site was selected in Riverside Park at Indianapol
This hatchery was not completed when he went out of offi
and still remains in an incompleted shape due to the high co
of constructing the buildings needed. The hatchery, howev
was operated last year in conjunction with the Marion Coun
Fish and Game Protective Association, which operates a hatche
immediately adjacent. The same arrangement will be carri
on until the hatchery is finally completed. Interest in fish c
ture and the restocking of the waters is increasing everywh
about the State. Within a short time, the Division of Fish a
Game will have for distribution a pamphlet entitled, "Fish C
ture on the Farm." This is to stimulate scientific fish cult
by private enterprise. The Division is also now operating
game experiment station at Bluff Mills, in Montgomery Coun
The purpose is to test out the breeding of various game anim
and birds. From time to time pamphlets setting forth how
breed fur-bearing animals, quail, wild turkeys and pheasa
based on actual experience will be published. By this me
interest in game breeding will be aroused. It is not the purp
to attempt a restocking of the State with birds and anim
reared by the State. More than seventy thousand dollars w
expended for stocking the state with game birds purchased
the purpose by former Commissioners. It was found impr
ticable and useless. The birds did not stay where they w
put, and with few exceptions later disappeared.

The foregoing brief history gives the progress of fish and ga
conservation in the century now passed. The hope for conser
tion in the next century lies in the education of the people to
real need and value of fish and game to themselves and to gene
tions that will follow, and to educate them to such a point, t
they will practice conservation, not because the laws dem
it, but because it is best for all of the people.

CONCLUSIONS OF THE CONSERVATION COMMISSION

W. A. Guthrie, Chairman — *Stanley Coulter*
John W. Holtzman — *Richard M. Holman, Sec.*

Preparedness is the keynote of the work of The Department of Conservation. We cannot righteously continue to jog contentedly along in the present with no thought of the years to come. We cannot afford to disregard the experiences of older nations in the utilization of their natural heritage. We must realize that each year sees thousands added to the Hoosier population. It is inevitable that Indiana will some day be the home of many millions. We shall have the same intensive use of our soil, our mines, our streams, our forests and of all our resources that we now find on the Continent. Then, the coal and oil we do not waste, the fertility we maintain, the forests we preserve and plant, the parks we dedicate, the streams we purify, the lakes we save from destruction will be a heritage left to our successors, the treasure trove from which we drew judiciously and did not waste.

Natural resources are the wealth of the State, the people are the State and the people through their laws have made The Department of Conservation—governed by The Conservation Commission—the executive offices which care for and prevent the waste of their natural wealth. The Department carries out the orders of the people as expressed in their laws. With the citizens of Indiana lies the initiative, they are the mainspring which actuates The Department. The people are coming to feel the public duty and the necessity of action and hence, we may expect to see the work of The Department broadened. The Commission realizes this and is confronted with numerous problems.

Indiana is today without a topographic map of the State. Ohio and Illinois, her neighbors, have. The office of The Department daily receives requests for such maps which show all land formations such as hills, valleys, streams, lakes and in addition, woods, bridges, schools, farm buildings, towns, cities and all such features. The farmer, the manufacturer, the railroads, the engineer, the road builder, the schools, the surveyor, in fact all industries and endeavors need it. It would save many millions of dollars which are lost by lack of it. The Federal government will pay half the expense of making such a map. We only procrastinate and delay our development by evading this necessity.

Indiana wood-using industries employ 70,000 people, are capitalized for $175,000,000 and produce $140,000,000 in products

annually. Indiana hardwoods were once the standard of the world. We have sold, destroyed and wasted millions of acres of forests, we do not know from where our future supply will come, and yet we do nothing. The State must take action and purchase the large areas of land which are suitable only to forestry and maintain them in forests for the future needs of our industries.

Relics of our pioneer days and industries have practically disappeared and we make no effort to save some for the education and benefit of present and future Hoosiers. Our present state museum is a misnamed storehouse which is too small to exhibit the small collections we do have. There is no opportunity to reset one of the very few pioneer log-houses or primitive mills. There is no room to place a stump of any of the great trees which once covered the State and of which a very few remain. We cannot exhibit early fabrics or set up the tools and appliances of our primitive industry.

We have no space for necessary laboratories and the State Board of Health is forced to seek quarters in other buildings for theirs. Indiana has always taken a great interest in education and in fact was a true pioneer in that work. Yet there is not sufficient room for the storage of the books of the State Library without even considering their display.

We talk of a State Memorial. Why not secure the ground lying west of the State House along the canal, as far as Camp Sullivan Park, also state land? Build here a building suitable to the deeds it commemorates and house in it the scientific and educational departments of the State. A plaza would connect with the Capitol Building along which future State buildings will be placed. The State House has been outgrown and we must soon have additional State building.

There is much work ahead and many, many problems. The Department of Conservation, though only one year old, is thoroughly established with an energetic, willing, inspired organization of men and women. We ask the cooperation and good will of the people of the Commonwealth and we know we shall have it. Every *Hoosier* shall be a *Conservationist,* who believes in the *State* and the *laws* which are in force to *Conserve* its *Natural Resources* for the *Benefit, Education* and *Recreation* of all *Hoosiers Now* and *To Come.*

Editorials on Conservation Clipped from Indiana Newspapers.

CONSERVATION AND THE PRESS

What progress has been accomplished by the Department of Conservation—and the citizens of Indiana are the judges—is in a large measure due to the splendid and unstinted cooperation of the Hoosier press. Indiana newspaper editors are the Department's most formidable allies engaged in a concerted effort in disseminating the gospel of conservation, propagation and judicious utilization of our native riches, into the most remote districts of our Commonwealth.

Because the mission of the coordinated new state department was relatively little understood when created a year ago in April, it necessarily became imperative that a people living amidst seemingly unlimited resources and accustomed to prodigal waste and despoilation of God-given wealth, should be educated to the idea of nurturing their possessions. In this respect the duty of the Department and the Press was not unlike the pioneer of old, for where he carvd from an unbroken forest fastness that civilization might follow, these pioneers in conservation are charged with molding public thought against reckless devastation and needless despoilation.

The Department officials and the people of Indiana, and especially generations to come, owe a great debt to the press of the state for its noble championing of a work that by prolongated effort is destined to convert Indiana into the ideal state. It is therefore graifying to the Department of Conservation of Indiana to present herewith, excerpts from some of the state's leading newspapers, voicing the opinion of their editors why conservation is imperative if the populace of this domain is to enjoy unintermittingly of nature's bounties.

"CONSERVATION"
(Vincennes Sun)
(Indiana's Oldest Newspaper)

The oasis in the desert of economic unrest and cries of under-production is the satisfaction of knowing that in Indiana there is a department of state which is working for conservation.

It is not a mirage.

The ultimate consumer has been given much publicity in recent years and efforts have been centered perhaps not too strenuously on the work of stimulating production. But stimulating production in our factories means the consumption of raw materials. Consumption of raw materials is the antithesis of the functions of the Department of Conservation.

Were it not for this Department, the future of Indiana would not be underwritten for the benefit of the coming generations. This Department is constantly looking ahead. It anticipates the needs of Hoosiers in the years to come. It emphasizes the careful and un-wasteful use of the state's resources now.

It is a governor on the commercialization of Indiana's great inherent sources of energy, raw materials, and natural wealth.

The work of this department is not measured in dollars and cents and its benefit to the Commonwealth cannot be estimated. Its labor is almost charitable in nature but is such that will yield dividends—a thousand fold. Its support and kindly cooperation of every Hoosier should be of paramount interest throughout the State.

"CONSERVATION COMMISSION"
(Indianapolis News)

With the organization of the new conservation commission, created by the recent legislature, the state should get much better service in this important line of activity. The appointments made to this new body by the Governor will be generally approved. Professor Stanley Coulter, of Purdue University, is well and favorably known as a scientist, and was a member of the state board of forestry. John W. Holtzman showed as mayor of Indianapolis fine executive ability, and a sense of responsibility to the public. As a member of the state board of forestry and of the state food production committee, W. A. Guthrie rendered valuable service. Richard M. Holman, professor of botany in Wabash College, has the knowledge, and doubtless the ability needed to qualify him for the place. In its selection of Richard Lieber as director, the commission chose a man who has given much time and toil to conservation of the state's natural resources, and from whom faithful and intelligent service may confidently be expected.

Here we have a specimen of that reorganization that was so strongly urged by the Governor. For in this new department are to be merged the offices of state forester, state entomologist, and state geologist, the occupants of those places all being retained as heads of divisions in the new department. Mr. Lieber, the director, will also act, without additional salary, as chief of the fish and game division, and the lands and waters division. Thus we shall have that "unity of command," which we have learned, by bitter experience, is so necessary. The men in charge of the work, it should be added, were not chosen for political reasons, but for fitness. There is no politics in the new commission.

There will be an abundance of work for it to do—the work of the greatest im-

portance. The state has long needed an agency of this kind. Now that we have it, we should have also the closest co-operation and the firmest support on the part of the people. With an efficient organization manned by good men the state has a right to expect great results.

"A NEW DEPARTMENT MAKING GOOD"
(Indianapolis Star)

Much progress toward the conservation of the natural resources of Indiana has been made during the past year by officials of the state conservation department, under the direction of Richard Lieber. The various departments of the state government, dealing with the resources of the state were for years under separate heads and without any correlation of efforts. The last Legislature, through the establishment of the new department, brought the direction of all the various agencies of the state concerned with conservation problems under the control of the state conservation commission and the conservation department.

The new department has accomplished many beneficial results in the first year. The state game warden service has been completely reorganized and many law violators have been arrested. Particular attention has been given to the supervision of the state parks in an effort to make these places attractive recreation centers for the people of Indiana. The division of entomology has done good work in coping with the insect and disease pests of Indiana crops. Special attention has been given to the development of state forestry.

The work of the department has been outlined with vision and should produce increasingly important results with each succeeding year. Conservation of natural resources is a very live question in these days of increasing demand and dwindling supply. Indiana, like too many other states, has been prodigal of its natural resources even to wastefulness, but has awakened to its error. The new department will do what it can to overcome the mistake of other days and to make intelligent use of the still bountiful natural resources of the state.

"THE LUXURY OF CONSERVATION"
(Indiana Times)

The Times has again been urged by the director of publicity of the Indiana department of conservation to present it with an editorial expression, which, according to advices, will be incorporated in "the souvenir pamphlet" to be issued "when Indianapolis pauses and retrocedes 100 years to its nativity."

The Times believes in conservation. It believes in conservation so strongly that it can see no particular excuse for wasting a perfectly good lot of paper in "souvenir pamphlets," prepared at the expense of the state and appreciated by no one.

And while this paper is in hearty accord with any real movement for the conservation of the native resources of Indiana it has nothing in common with Jim Goodrich's "department of conservation," created at heavy expense to the taxpayers for the principal purpose of providing jobs for republican politicians.

If conservation is only to be obtained by maintaining a branch of the "centralized republican state administration" then conservation is too much of a luxury for the state of Indiana.

"CONSERVATION"
(Crawfordsville Journal)

Indiana, along with other states in the Union, has in previous years shown a too reckless disregard of natural resources for the good of the present and future generations. Nature was extremely generous when she formed the territory now embraced in the boundary lines of the state but the pioneers and their followers were too often lacking in the vision that today would make this the ideal state. They were not different from others of their kind but they failed to appreciate the great growth the Hoosier state was destined to make and did not make provision for the conservation of the blessings with which nature endowed this country. They wasted, using for immediate needs what better could have been saved against the future, for every generation owes a debt to posterity.

Now Indiana is trying to make amends for neglect in the past by conserving as best she may the natural resources that are left even though the plan call for a considerable sacrifice and is wisely working through a department of conservation with Richard Lieber as director of conservation. A great deal has already been accomplished but there is much to be done. The present generation is already enjoying the fruits of this plan and with wise and liberal encouragement the work of the department will expand in a manner to make this one of the ideal states in which to live.**********.

"OUR NATURAL WEALTH"
(Indiana Farmer's Guide)

We commonly think of Indiana as an agricultural state and comment on our prize-winning grain and pure-bred live stock. Geologists, however, remind us that in addition to agricultural resources, the state is a leader in the production of natural resources. W. N. Logan, state geologist, states that Indiana could supply

herself for an indefinite period with coal, petroleum, gas, iron, building stone, lime, cement and salt. The coal beds of the state occupy an area of approximately 7,000 square miles in the western and southwestern parts of the state. One or more of these beds underlie the whole of 16 counties and parts of 10 others. The state ranks sixth in the production of bituminous coal. A large portion of the petroleum produced in the state comes from portions of Grant, Blackford, Huntington, Wells, Adams, Jay, Delaware, Madison and Randolph counties. The annual production in the state is still in excess of one and one-third million barrels. In the marsh and lake regions of northern Indiana, there are approximately 36,000 acres of workable peat beds. This material can be used in various forms as absorbent, packing material, deodorizer, fertilizer filler, and for the manufacture of glass, coke and ammonia.*********Indiana is widely known as a producer of high-grade building stone.*********More than 3,500,000 tons of sand and over 2,500,000 tons of gravel are produced annually. There are many important mineral springs in the state.*** These figures were given out in a recent geological report and give the reader some idea of the natural wealth of the state.

"CONSERVATION"
(Greensburg Daily News)

In this day of unintermitting demand for augmented production, it is indeed gratifying to know that Indiana has a branch of state government, the duty of which is to designate the way whereby the state's citizenship can subjagate the frequent allegations of under-production, and simultaneously so increase our native wealth as to bequeath a legacy to posterity.

This branch of government is known as The Department of Conservation, operating under a coordinated system of which Richard Lieber, is the executive head.

Years ago when ours was a virgin country, abundant in undeveloped wealth and pristine beauty, early settlers frequently were forced to destroy in self defense. Particularly was this true as regards the wild game life. In later decades vast timber wealth, at first but sparsely used by the pioneers, was removed with reckless abandon as commercial interests expanded, until today where once stood apparently inexhaustible forests, there remains but a remnant of our historic timber tracts of yesteryear.**********And so it was with our natural gas, oil, coal and other native wealth, spent in the last few years with reckless abandon.

The Department of Conservation has achieved much in the little over a year it has functioned, and because correlated efforts are now at work toward conservation, utilization and propagation of our native wealth, much may be expected from this department that is engaged in underwriting these native assets for the generations to follow.**********

"DEPARTMENT OF CONSERVATION"
(Owen County Leader)

At the forthcoming centennial celebration at Indianapolis in June, when the capital city will celebrate her 100th birthday, one feature will be the contribution of the Department of Conservation. This branch of the state government is one of the most important—in relation to posterity—in the state. It has to do with the conservation, utilization and perpetuation of the state's natural resources.

While this department is, comparatively, a new branch of the government, yet it has made a remarkable showing and is due to make still more advance as the idea of conservation gains momentum. This can only be when the people fully understand—and appreciate—the need of saving and the necessity of reducing waste to a minimum. This nation has been a wasteful nation and is, as yet, only beginning to learn the need of saving.********We have been prone to look upon our resources of every kind as absolutely endless, never realizing that our supply could ever be exhausted. The lesson of the Indiana gas belt a few years ago seems to have made no impression.

It is the department's job to educate the people along the line of thrift; to make them realize the rapid diminution of resources and engender in them the thought of getting the maximum service out of every resource at our command. This education must come soon, if we are to do the right thing by our posterity. The timber is already gone; the coal is going; the gas which, but a few years ago, we found cheaper to keep burning than to turn out, is a thing of the past. We must learn, not only to conserve, but to replace. As the timber is cut there must be more timber planted. The Department of Conservation has a monster task before it in spreading the gospel of thrift.

"CONSERVING THE STATE'S NATURAL RESOURCES"
(Richmond Palladium)

Of paramount importance to each citizen individually and to the commonwealth as a whole is the problem of conserving the natural resources of the state. It affects this generation in no small degree and is of vital importance to the children of the next.

Time was when we were profligate with the natural wealth of our state. Splendid forests of hard timber fell before the settler's axe to make way for fertile acres that today produce no small part of the state's wealth.

Natural gas in copious quantities flowed from thousands of wells that were drilled after the first successful exploit near Portland in March, 1886. What in

those days was believed to be an inexhaustible supply soon disappeared by reason of the extravagant and often flagrant misuse of the fuel. Natural gas from Indiana fields is today a memory, and our citizens depend upon an uncertain supply piped from the West Virginia fields and have been informed that within a year this will cease.

Many square miles of our soil have been despoiled of their fertility by failure of farmers to rotate crops and heed the advice of the agricultural experts at Purdue University.****

And so the instances might be multiplied of a short sighted policy of which all states of the republic were guilty. Lately we have seen the error of our ways. The necessity of conserving what is left and handing it down to future generations as a priceless heritage is beginning to dawn upon us.

The department of conservation is preaching this gospel in season and out. Hoosiers are experiencing a new pride in conserving the natural resources of the state. A good beginning has been made. Splendid results will follow.*********

"SHALL WE LEAVE THE MEAL BAG OPEN AT BOTH ENDS?"
(The Muncie Evening Press)

The youth who saves his patrimony and adds to it is given greater commendation than one who scatters his inheritance, even though the latter may recoup his losses by hard work. After the United States for a hundred years and more has been wasting her wonderful natural resources she is just now beginning to rub her eyes preparatory to waking up to the fact that some day she is going to be out of wood, out of fuel, out of newspapers even, because she has not realized that it is impossible to eat her cake and have it too.

Indiana is one of the states of the union that has a Department of Conservation. It is directed by Richard Lieber who devotes all his time and energies in the attempt to impress upon the people of the state that our meal-bag is open at both ends and that we should do something about closing it.

Our forests are disappearing—have almost disappeared—and it has been but a short while, comparatively, since Indiana was covered with trees, with small prairies between the forests as islands in the midst of a great sea. Now most of the trees are gone and the state is become, as a result, a prey to the sudden flood and the destroying wind.******

These only are a few of the results of our own carelessness and extravagance which the Indiana Department of Conservation has set itself against. It can do much to preserve the natural resources still left us and add to them, or at least to some of them. It can restock our streams and reforest some of our lands and protect what little game remains and increase it.

But to do these things it will need the co-operation of the public. It must seem to Mr. Lieber and his associates sometimes to be a rather dreary thing, this thing of getting the public to see the importance of acting to save its own wealth—much of its wealth that once gone can never be replaced.****

The Indiana Department of Conservation is doing pioneer work in trying to arouse the public mind upon the important subject of saving the riches we have and as such deserves the thanks and aid of thinking people of the State, but we doubt whether it will receive much aid or many thanks until such time as we understand that if we run out of food we'll starve—and what is still more important, apparently, to a good many people, that if we run out of fuel and lumber the movies will have to close.

"CONSERVATION OF RESOURCES"
(Newcastle Courier)

There is no department of the State's business more important than that which pertains to the conservation of the resources of the state. One has but to traverse the land of worn-out farms of many sections of the east or the tree-denuded areas of the middle west to realize how much a neglected policy of conservation has cost this country.

Indiana now has a real working department of conservation with a real working director, Richard Lieber by name. It was Mr. Lieber who conceived the idea of preserving some of the state's natural beauty spots such as Turkey Run. This Department plans to not only conserve but to utilize and perpetuate the natural resources of the state to the end that all classes of citizens may profit.

In its primeval state Indiana was well supplied with natural resources. There were no better growths of timber anywhere. Her streams abounded in fish, her forests with game, her soil was rich. Underneath were great beds of coal, lakes of oil, wonderful pockets of gas, one of the greatest luxuries of the age.

Without organized conservation we have seen the reduction of the forests to a degree which has wrought adverse change in climate. We have seen the fish taken from the ponds and streams without effort to protect and propagate, until recently the supply for future use must come through restocking of our waters. The wild game of course disappeared with the forests and while many species of this variety of nature's resources such as bears, wolves, panthers and venomous reptiles, can well be dispensed with, the same causes removed many of the useful animals and birds.*********

Now that the cost of living is so high there is a greater necessity than ever before for the elimination of every waste of every kind, and the conservation of every energy and the utilization of every resource for not only the present but for the future. It is a great work the state department of conservation has undertaken and it should have the hearty support and cooperation of everyone.