

# Soil Survey of Parke County.

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## EARLY HISTORY OF PARKE COUNTY.

Ref. Atlas of Parke County 1874. By A. T. Andreas.

“Parke County was organized, by act of the Legislature, in 1821. It was named in honor of Benjamin Parke, the first member of Congress for the territory, and afterwards territorial judge. \* \* \* The county contains about four hundred and forty square miles, with a population in 1870 of 18,195.

“*Early Settlement.*—The territory now embraced in Parke County began to be settled before the county was organized. It is not positively known who the first settler was, but we have obtained information reaching back nearly sixty years, and including ‘old settlers’ in nearly every part of the county.

“When the land was sold in the county, an Indian reservation was made, running up and down the Wabash River, from the mouth of Sugar Creek to the mouth of Big Raccoon, and about seven miles in width. Reserve Township now embraces most of the territory. It was all sold with other lands, except what Christmas Dazney, a noted half-breed, inherited near Armiesburg, where he lived as one of the first settlers of that locality.

“The Friends, or Quakers, settled in Penn Township, in about 1825. The settlement increased afterwards, becoming quite numerous. The Friends have a large church and high school at Bloomingdale, the latter under the care of Prof. B. C. Hobbs, who made it a superior school for the education of boys.

“The primitive condition of Parke County at that time (about 1821) may be inferred from the fact that his (Pearly Mitchell) nearest neighbor was four miles away; deer, wolves and bears were plenty, and several bands of the Miami and Kickapoo Indians were still in the neighborhood, and the whole population of Parke County did not exceed one hundred persons.”

Parke County is located in the western part of the State. It is bounded on the north by Fountain and Montgomery counties, on the east by Putnam and Montgomery, south by Clay and Vigo, and on the west by the Wabash River. The civil townships are

thirteen in number, and are Liberty, Sugar Creek, Howard, Reserve, Penn, Washington, Green, Wabash, Adams, Union, Florida, Raccoon and Jackson.

#### GEOLOGY AND PHYSIOGRAPHY.

1898. G. H. Ashley, 23d Ann. Rep. Dept. of Geol. and Nat. Resources. Chap. XIX. Parke County. Page 297.

¶424. Section 1. *Drainage and Topography*.—"Parke County abounds in large streams. The Wabash River, flowing along the western border, receives in this county the waters of Coal Creek, Sugar Creek and Raccoon Creek. The latter two streams rise well to the east of this area and carry an abundance of water. All along the eastern side of the Wabash the bottom lands tend to have a width of one or two miles, back of which rise the bluffs from 100 to 250 feet high. Sugar Creek appears to be flowing through a post-glacial channel, as far as the mouth of Rush Creek, its immediate valley being usually narrow and often hemmed in by cliffs of sandstone, yielding many excellent exposures of the coal measure rocks, and affording some of the most picturesque scenery of the State. Its principal tributaries from the north are Rush Creek and Sugar Mill Creek. The latter valley is somewhat of the type of Sugar Creek; the former is thought to have been possibly the preglacial channel of Sugar Creek, and its banks show little but glacial deposits of sand, clay and gravel. From the south side the principal tributary is Roaring Creek, which, in the lower part of its course, winds through a narrow, rocky ravine. Many of the smaller tributaries of Sugar Creek are, over the lower part of their courses, inclosed in rocky gorges with perpendicular or overhanging walls, these gorges being often from 50 to 100 feet deep and sometimes of a less width at the top than their depth, as at Turkey Run.

"Raccoon Creek and its principal tributary, Little Raccoon Creek, occupy their preglacial channels as far as Rosedale, above which point they have broad bottoms and yield but few exposures. These broad bottoms from Rosedale pass southwest into Vigo County, showing the former course of the stream. At present it turns northward at Rosedale and flows nearly parallel, though in an opposite direction, from the Wabash River, emptying into that river at the old mouth of Leatherwood Creek. This part of the channel is comparatively narrow and the side ravines yield numerous exposures, but it appears to have been a channel of

some kind in preglacial times, judging from the fine deposits of gravel exposed along its banks. The principal tributaries are Leatherwood, Rocky Run, Iron Creek, Little Raccoon, with its tributaries, Wiesner's Branch, Williams' Creek and Sand Creek—Stronger's Branch, Rocky Fork, Troutman's Branch and many smaller tributaries.

“As may be judged from the roads shown on the map, the surface of Parke County is much broken, especially in the eastern part, where the divides tend to become sharp-crested ridges. There are, however, all over the county, small, scattered patches of the level land so characteristic of the visit of the glacier.”

¶ 427. “Section 2. *Surface Geology*.—Parke County is entirely within the drift-covered area, though as a rule not as deeply buried as the counties to the north. The drift may be said to range between 25 and 75 feet, averaging nearer the former and occasionally running over the latter up to probably 150 feet. Probably the principal reason for the comparative thinness of the drift in this county is the presence of many large streams. These large streams, by cutting deeply, greatly lower the main drainage level, below what it would be with only small streams present. This gives a greater fall to the tributary streams and results in a much more rapid erosion. Away from the influence of these larger streams the conditions are much as in the flat areas of the surrounding counties, and the drift is still often 100 feet or over deep. A terminal moraine crosses the county from east to west across the southern end, producing hummocky topography and unusual depth of drift wherever the erosion has left it undisturbed. Some preglacial channels are found, but not many. Mention of these is made in the detailed description.”

¶ 428. “Coxville Sandstone (Merom?).—In the earlier reports much was made of a number of ‘conglomerate’ (Mansfield sandstone) ridges, supposed to cross the county from east to west, dividing it into a number of bays or basins in which the upper coals were laid down. It was found that what were taken to be ridges of Mansfield sandstone are the sandstone fillings of a deep and broad erosion channel or system of channels carved out of the upper measures. Not only are channels cut down through the measures, but there appears to have been extensive though shallow erosion for some distance on either side of the immediate channel, also filled with sandstone. This erosion has profoundly influenced the amount of workable coal in the county. The filling is best

exposed in section on the northeastern side of Raccoon Creek at Coxville. As yet, it has not been possible to accurately set the time at which this erosion took place and to which the sandstone now filling these ancient valleys was laid down. The evidence points to either a short time after the laying down of Coal VI or to a time entirely subsequent to the deposition of the coal measures proper, or at a time corresponding with the laying down of the Merom sandstone of Sullivan County. The latter theory is considered as best sustained."

¶430. *Lower Carboniferous.*—"The Lower Carboniferous underlies the coal measures of the whole county and outcrops in the northeastern part and in the stream valleys over a still larger area. The rocks appear to be the Mitchell Harrodsburg limestone and the Knobstone, the latter predominating to the north."

¶492. *Coal Measures on Sugar Creek.*—" \* \* \* The coal of this district is very irregular, due apparently to this being in the path of the old Coxville carboniferous river, met with at Silverwood. Not enough detailed work was done to settle this question definitely, but from what was noted we were led to surmise that the old river channel crossed Sugar Creek at Rockville. The resemblance of the sandstone filling to the Mansfield sandstone exposed both up and down the creek and the failure to find just the data needed renders this opinion somewhat doubtful. There is, however, some outside data that tends to confirm that theory; principally, that this old filled channel is plainly exposed at Silverwood, and the appearance of certain sandstones in Sec. 5 of this township (17 N., R. 8 W.) indicate that the channel was not very far away. Evidence of it are next met to the southeast along the middle course of Roaring Creek and in the region of Sand Creek. Rockville is in the line between these places and is moreover the only place along Sugar Creek where such a crossing appears to have taken place. \* \* \*"

¶494. *Up Rush Creek.*—"No coal was seen along Rush Creek, whose bluffs generally show only drift, suggesting, as said above, that Sugar Creek may have formerly followed this channel from Kingman. \* \* \*"

¶543. *Location, Etc.*—"This township (14 N., R. 8 W.) is nearly in the southwestern corner of the county and corresponds to the eastern two-thirds of Florida of the civic townships. The southeastern and eastern part of the township is characterized by the broad, level bottoms of Raccoon and Little Raccoon creeks;

this is continued northward as a somewhat narrower valley down Raccoon Creek across the center of the township. The V-shaped area north of the junction of the two creeks is cut up by Iron and Wiesner creeks into three broad rolling divides and two narrow valleys. West of Raccoon Creek is a high, flat tableland, from which rise the hummocks of the terminal moraine that crosses here."

(T. C. Hopkins, 20th Ann. Rep. Dept. of Geol. and Nat. Resources. Pp. 262-263.)

*Turkey Run and Vicinity.*—“Along Sugar Creek, between the mouth of Sugar Mill Creek and Turkey Run, sandstone outcrops in a number of places, but it is of inferior quality for building purposes. Through the south part of Sec. 28 (17 N., 7 W.) are some bold bluffs of Mansfield sandstone, which contain much iron oxide and false bedding.

“Turkey Run has cut a narrow, winding channel through the Mansfield sandstone 40 to 60 feet deep, with nearly perpendicular and, in places, overhanging bluffs on either side. The stone is yellow and gray in color and contains numerous streaks and patches of iron oxide. While stone for heavy masonry might be obtained here, it is doubtful if first-class building stone could be obtained in paying quantities. The same is true of the stone along Sugar Creek, between Turkey Run and Rocky Hollow, in a less degree, as in some places along the north side of the creek there are patches of considerable extent which appear to be free from the iron blotches. Mr. Hooghkerk reports that in drilling the well at the Turkey Run Hotel the drill passed through:

Gravel and sand.....	31 feet
Sandstone (Mansfield) .....	30 feet
Limestone .....	2 feet
Sandstone, white, fine-grained (Riverside).....	30 feet
	—
Total .....	93 feet

“The limestone is supposed to be Lower Carboniferous and the sandstone overlying it the Mansfield sandstone.

“The sandstone in the vicinity of Turkey Run has been deeply scored by the glacier, the sand that has been scraped off being distributed over the region to the south. Glacial striæ bearing south, 37 degrees east, are clearly shown in two places: one about a quarter mile east of the hotel, the other more than half a mile east. This glacial action has scraped off all the disintegrated material

from the top of the sandstone, if any such ever existed, and the fine state of preservation of the striæ shows that there has been no disintegration of the stone at these points since that date, probably several thousand years ago, surely a strong proof of the durability of the stone.

“*Rocky Hollow*.—Rocky Hollow, which lies mostly in the north-west quarter of Sec. 27 (17 N., 7 W.), is a deep, narrow gorge cut into the massive Mansfield sandstone. The walls are so high and precipitous that the gorge can be entered only at the mouth and at the head of a few of the terminal ravines, many of which are cut down so abruptly at the terminus as to be practically inaccessible. No part of the gorge can be traversed except in time of low water. While much of the stone along the bluffs is cross-bedded and ferruginous, in a number of places it is free from imperfections and would furnish good buff and gray building stone, should it ever be made accessible to transportation. This deep, winding, rocky gorge, with its precipitous, overhanging, moss-grown walls, is a romantic spot and attracts a great many tourists during the summer months. \* \* \*”

## SOILS.

### KNOX FINE SAND.

This type of soil has a topography comparable to a region occupied by sand dunes. The conspicuous features are the well rounded hillocks and ridges along with the depressions or basins. The dune-like surface along with the porous soil results in a drainage that is extreme. Crops are often affected by deficient moisture in the soil.

The Knox fine sand is made up chiefly of loose, unconnected, relatively fine sand. The organic matter present is usually small. The subsoil at a depth of ten to twelve inches is a light brown to yellow sand. Often pockets of extremely loose and incoherent grayish sand are found in the subsoil. The color of the soil varies, in places it is light brown, again it is yellow, this being determined by the amount of organic matter present.

The Knox fine sand is found bordering the Wabash River and on the uplands adjacent first bottoms. There are three regions in which the Knox fine sand is typically developed. In Liberty Township, about Howard, the type occupies uplands. The region is cut in two by Coal Creek, but the sand appears again west of

Waterman and extends to the river bridge at the junction of Fountain and Parke counties.

There are a few springs near the top of one ridge, the water of which stands within four or five feet of the surface during the driest part of summer. In places only a few yards distant from a good shallow well, water can not be reached even at great depths.

In Reserve Township an area of Knox fine sand extends from Montezuma north, being in total length nearly two miles, with an average width of one-half mile. The city of Montezuma is situated on the southern end of this terrace-like formation.

In Wabash Township, extending from the channel of Big Racoon almost to the Florida Township line, is a long ridge of regular outline. This ridge, although occupying the position of the Knox fine sand, is not typically developed. The undulatory topography is absent and more organic matter present. The slope to the east is gentle, reaching the lowest point about the position of the old canal, from which it rises gradually to the foot of the hills marking the eastern bank of the old river channel.

The third area in which the Knox fine sand is typically developed is north of Lyford, in Florida Township. It is an irregular area about two miles long with an average width of one-half mile. During the flood in the spring of 1913 only the highest points of this area remained above water.

The sand at present is by no means at rest. A strong wind blowing over a dry field unprotected by vegetation, drives the sand before it in sheets, as rain before the variable gusts during a storm. The distant observer might conclude that the wind is carrying dust particles only, but once in the path of the storm one will decide that there are small grains of sand being hurled through the air at terrific speed, as they beat upon the hands and face like so many little pellets of ice, during a storm of sleet.

The side of the stream upon which sand is deposited is determined by the direction of the prevailing winds. Indiana being in the region of the prevailing westerlies, sand is deposited on the eastern banks of streams. With this tangible evidence at hand, one readily concludes, as stated in other reports, that this type of soil is the result of drifting sand by wind action and the origin of this sand the valley of the Wabash River.

When the water of the Wabash River rises to a level with the bottoms of the depressions, water begins to rise in them, and as the water in the river continues to rise, the water in the basins rises.

This indicates the porosity of the sand near the base of the area. Since this is true, the inference is that there is not only a river of moving water in the visible channel, but another less voluminous, moving, however, on either side of the larger one, through the coarser sands toward the uplands. This great underground reservoir, storing away large quantities of water, holding it in reserve from the mighty visible river of water, tends to prevent devastating floods. It returns its water gradually as the water in the river is lowered. This reservoir of unseen water serves to keep the river in normal flood longer as the water returns slowly from these sandy hills. Thus these porous banks are the governors whose tendency is to maintain a normal stream.

Small patches of timber, in which scarlet oak predominates, are scattered over the area. Fruit and truck farming are well adapted to this type of soil. Melons, rye and corn are the principal crops grown. Alfalfa is being successfully grown in parts of the area.

#### KNOX SAND.

The Knox sand occupies a small area in the extreme southern part of the county in the vicinity of Rosedale. The topography is rolling, made up of low rounded hills and ridges.

The soil to a depth of twelve to sixteen inches varies from a brown to a light brown, slightly loamy. The subsoil to a depth of thirty-six inches is an orange-colored sand of about the same texture of the top soil. In structure the subsoil is looser and more incoherent than the top soil. The tops of the ridges contain less organic matter, and a very slight difference exists between the soil and subsoil. In the depressions the soil is darker in color and more loamy, yielding better crops than on the ridges. The sand consists largely of rounded quartz grains. It is of glacial origin, having been reworked by the action of wind and water.

The porosity of this type of soil causes crops to suffer in dry seasons, because of its incapacity to retain moisture. The soil must be supplied freely with barnyard manure or anything that will increase the organic matter in the soil. Corn, wheat and oats produce moderate yields. Hairy vetch of the winter variety is being tried on this type of soil south of Rosedale. Alfalfa should be grown in the depressions where the roots of the plant could reach sufficient moisture.



## CARRINGTON SILT LOAM.

Only a small area of this type large enough to separate was encountered in Parke County. Small patches formerly occupied by ponds are scattered throughout the Knox silt loam area, but not of sufficient size to separate. In Sugar Creek Township an irregular area consisting of four or five hundred acres, east of Grange Corner, is the only area of Carrington silt loam mapped.

The area was in early times a swamp but now it is well drained. Good yields of corn, hay and other crops are harvested. The ground is too "strong" for oats, it producing a rank growth of straw and the danger of its falling badly before harvest time is encountered. The soil consists of a dark brown to black silt loam. The top soil varies in depth from ten to twelve inches. At this depth the soil changes to a drab-colored subsoil mottled with yellow, the clay content increasing with depth. This type occupies relatively flat areas, natural drainage being poor.

The soil consists of material derived from glacial till mixed with a large quantity of organic matter. Corn yields forty-five to sixty bushels an acre, depending upon the season as well as upon methods of agriculture. When scientific methods of agriculture are followed the result is inevitably shown in the resulting harvest.

The price of land is not so high as would be expected of this type of soil. The reason is not far to seek, as marketing facilities are not good, the area being distant from any railroad accommodations. Land sells for \$125 to \$135 an acre. Good gravel roads connect this area with the neighboring towns.

## KNOX SILT LOAM.

The Knox silt loam represents the prevailing type of soil in Parke County. The type consists of a light brown or dark gray to a white silt loam. When wet the soil changes to a dull gray. Iron concretions are often apparent on the surface and through the soil. Small areas of this nature are found throughout the area of the Knox silt loam. These iron concretions are noticed more readily in fields that have been plowed and rolled, after heavy rains. They are more conspicuous in wheat fields after being exposed to the freezing of winter and the heavy rains of spring.

Another peculiarity of this class of soils is that in breaking, the plowshare is constantly grating as if passing over small pebbles, but an examination of the bottom of the furrow will show numerous stripes made by the plow in crushing the little nodules of iron.

The grayish color of the soil in which these iron concretions are found is due to the fact that the iron, the coloring matter of the soil, is locked up in this "turkey gravel" or "buckshot," as the concretions are locally known. They are always associated with the light colored soils and one that is poorly drained. The soil is compact, has good absorbent capacity, and though it is seldom covered with water more than a few days at a time, is saturated during most of the winter and spring months. This condition favors the formation of concretions. Thus with the iron oxides formed in these nodules the coloring matter has been withdrawn from the soil, leaving an ashy gray color.

If this quality of soil is well underdrained so as to relieve it of its saturated condition, and give the air thorough access to the soil, these iron pellets will in a few years dissolve and the iron will again become the coloring matter of the soil. The soil will then take on the proper brownish tint that it should have to be a valuable, productive soil.

The soil with the nodules is not in favor with the farmers, it being designated a "cold, sour" soil, which describes its qualities well.

Thorough drainage and use of ground limestone one and a half to two tons to the acre every three or four years will with its high absorbent properties become a very productive soil, one that will be durable and retentive of manures. The native forest trees were beech, oak, hickory and elm. When cultivated under good moisture conditions the soil is loose and easily kept in flour-like condition, but when plowed wet clods of great size and hardness will be formed and are pulverized with difficulty.

In some localities farmers say they are injured more by too much than by scanty rainfall. By deep plowing and intensive, shallow cultivation, good yields of grain are harvested. The surface of the Knox silt loam is loose, with a "flour-like" feel, but a few inches below the surface it becomes compact, puddles easily and runs together. With this difficulty to contend with farmers should be very cautious in regard to working the ground wet. Deep plowing should be practiced. The depth should vary from year to year to avoid the formation of "plowsole," an artificial hard pan.

Reference: "Soils," by Hilgard, p. 186.

*Plowsole:* An artificial hard pan is very commonly formed under the practice of plowing to the same depth for many consecutive years. The consolidated layer thus created by the action of

the plow (hence known as plowsole) acts precisely like a natural hardpan, and is sometimes the cause of the formation of a cemented subsoil crust simulating the natural product. This is most apt to occur in clayey lands and greatly increases the difficulty of working them, while detracting materially from the higher productiveness commonly attributed to them as compared with sandy lands. Of course it is perfectly easy to prevent this trouble by plowing to different depths in consecutive years and running a subsoil plow from time to time. In this case, also, lime will generally be very useful and be found to aid materially in the disintegration of the "plowsole."

In action the common mouldboard plow is that of a wedge driven through the soil, which separates and overturns the soil above the share while it puddles and compacts the bottom of the furrow over which it slides into a mass, if it is a clay soil, which in a few years becomes almost impervious to water. This layer is impenetrable to the roots of most crops. Sweet clover is very effective in breaking up this hard layer, making waterways and paths for roots weaker in penetrating power.

The primal fertility of the soil without proper crop rotation or the addition of a fertilizer is soon depleted, becoming sterile in a few years. The general condition of soils is now improving under more scientific management. The time is past forever when farmers will continue one field year after year in the same crop. Soils that were unproductive in the memory of many are now yielding abundant crops. Land is being restored from reckless agriculture, to something like its pristine condition, through a proper system of tillage, in which deep plowing and rotation of crops find a prominent place. The example set by the native vegetation should be followed by man as closely as possible. The deep roots bring the mineral substances from the deeper portions of the earth and, by process of decay of the growing vegetation, it is deposited in the upper soil.

In many places at a depth of ten to twelve inches there is encountered a layer of tough clay mottled with light yellow iron stains. This layer is four or five inches thick, below which there is a clay of paler yellow containing more silt, the moisture content being high. This layer must be broken up in order that the moisture can rise and supply the growing vegetation in times of extended drought. Sweet clover will prove a very valuable crop in breaking up this layer, as the strong roots penetrate this hard soil.

The soil auger should be used by every farmer. The subsoil should receive as much attention as the topsoil. If there is a layer beneath the topsoil the farmer should know it and every effort to break it up should be put forth.

Dynamiting is practiced in some localities to break up this hard layer.

#### MEADOW LAND.

All lands along smaller streams where little tillable soil is found has been classified as Meadow land. There are a variety of soils represented in this classification. There may be small areas of Wabash silt loam or Wabash gravelly loam and others, but the areas are so small they have all been mapped together. Most of the lowlands along the streams are in pasture and small timber. A great amount of the area is subject to seasonal overflow, being worthless for anything except pasture.

#### SIoux SANDY LOAM AND LOAM.

The second terrace of the Wabash Valley is in most places very sandy, underlain by coarse gravel at a depth of 16 to 18 inches. In other places the finer sand extends much deeper. The area varies in width from one-half to two miles. The eastern boundary of this area marks the eastern banks of the channel of the old Wabash River. The western boundary of the area is marked by an enormous gravel terrace which extends the full length of the county along the eastern side of the Wabash. It is not continuous throughout, but intermittent, as the area is cut by the channels of a few streams. The surface is rather irregular. The ridges of Knox fine sand appear in places along its western limits. In places the area is very level for great distances. The soils of the area vary considerably in character. In places it is sandy, changing to darker colored soil in which the organic content is high. In some of the lower parts of the area the natural drainage was poor, but artificial drainage has converted the former marshes and swamps into productive fields.

In regions where the sandy loam is typically developed the soil is from brown to black in color, a medium sandy loam, from 10 to 24 inches in depth, containing considerable amount of organic matter. The color lightens with depth. Gravel is found beneath practically the entire area. Extensive gravel pits are worked along the terrace and a great amount of gravel for road material and

railroad ballast is taken from this area. The supply of gravel is almost inexhaustible. The Sioux loam area is usually level and less sand and more silt and clay are found in the soil. The subsoil is of a loamy character to a depth of 24 to 48 inches, where gravel is usually encountered. Drainage conditions are good at present. In places where only a thin coating of soil covers the gravel subdrainage is excessive and crops suffer from drought. When the gravel is covered by three or four feet of soil, moisture is retained and better crops are grown in dry seasons. Corn yields from forty-five to seventy-five bushels an acre. It is an excellent soil for truck farming and fruit growing.

#### ANCIENT SOILS.

(From 12th Ann. Rept. of Director U. S. Geol. Survey, Part 1, pp. 321-322. By N. S. Shaler.)

“Although the soil-coating of the earth is in a certain way an ephemeral structure and is commonly subjected to immediate destruction where it is affected by the action of the waves, by glacial wearing, or by other violent accidents, some parts of this detrital coating in certain times and places have by chance been preserved to us from a remote geologic past. The first clearly recognizable deposits of this nature are found in the rocks of the Carboniferous age, where, indeed, they plentifully occur; beneath each bed of coal we commonly discover a layer of material which was the soil in which began to grow the plants from whose remains the coal bed was formed. So as far as these coal-producing plants were rooted forms they generally drew their sustenance from these ancient soils. We can still in many instances trace their roots, and occasionally we find the tree, fern or other plant to which they belong standing erect amid the swamp deposits which accumulated about it, and which now appears as coal. These soils of the Coal Measures differ from those now existing on the upland parts of the earth in certain important ways; they are generally of less thickness than are those of today which have been formed under similar conditions, and contain a rather smaller proportion of organic matter. These peculiarities are probably due to the fact that in the olden time there were few kinds of plants which had strong roots, and thus there was less opportunity for vegetable matter to become commingled with the earth.

“The most peculiar feature of these ancient soils consists in the fact that they usually lack those materials, such as potash and

soda, which are a conspicuous and a necessary element in the greater part of the soils of the present time. The general absence of such material has led to the occasional use of these ancient deposits as fire clay, *i. e.*, materials which will endure without melting the high temperature to which they are exposed in furnaces. In any ordinary soil a white heat will cause the siliceous element of the deposit to melt, for the reason that the lime, potash, or soda which it contains will combine with the silica when the mass is greatly heated, thus forming a glass or cinder. It is not likely that the present condition of the Carboniferous soils is that which they exhibited when plants first began to grow upon them; at that time they may have had the usual share of alkaline substances; but the very conditions which made these soils the seat of swamps secured the surface on which they lay from wearing downward in the manner common in ordinary districts, and so prevented the constant renewal from the underlying rock of the materials removed by vegetation. The result was that in time the earth below the swamp accumulation was deprived of the matter which could be removed through the action of plant roots. So far as these plants by their conditions of growth could take up soluble minerals of the soil, they removed them, storing the matter in their stems and leaves. When the plants decayed their waste fell into the peaty accumulation and gradually the mineral matter became leached out and conveyed away to the sea. As there was no means of restoring plant food, the soil gradually lost the power of contributing to the growth of plants. Thus while in the case of ordinary upland soils the process of decay in the underlying rock continually adds to the fertility, while the waste of vegetation is constantly returned to the earth, in most of these swamps of the Carboniferous time, on the contrary, all the conditions serve to pauperize the layer. Owing to various causes, however, some of which are to be noted hereafter, the soils beneath our modern swamps do not in the same complete manner undergo the process of exhaustion."

"It is probable that the progressive removal of the soil matter from beneath the swamps of the Carboniferous period had much influence on the development of the peaty material which in time became converted into coal. The larger part of their Carbonaceous material was formed from the waste of plants which required a certain amount of mineral matter for their support. This the plants had to obtain through their roots. After the swamp at-

tained a certain thickness, the continual leaching away of these substances would gradually limit the growth of the plants which tenanted the morass, and finally the growth might be entirely arrested by lack of such material to support the vegetation.”

## MECHANICAL ANALYSIS OF SOILS.

LOCALITY.	DESCRIPTION.	Fine Gravel, Per Cent.	Coarse Sand, Per Cent.	Medium Sand, Per Cent.	Fine Sand, Per Cent.	Very Fine Sand, Per Cent.	Silt and Clay, Per Cent.	Clay, Per Cent.
Knox Sand. South of Nigger Lake, Prairie, E. Rosedale.	Soil.....			8.1	28.4	29.2	32.4	
	Subsoil.....	.36	.06	2.4	33.3	34.0	28.9	
Knox Silt Loam. Mile and a half South of Kingman.	Soil.....			.9	7.6	12.8	77.4	
	Subsoil.....	4.8	1.8	2.9	5.7	11.5	72.7	
Knox Fine Sand. At Howard.	Soil.....		.03	.33	15.5	76.5	6.7	
	Subsoil.....			.3	12.7	81.1	5.0	
Sioux Sandy Loam. Between Montezuma and Armiesburg.	Soil.....	1.1	.96	9.6	21.7	16.8	45.0	
	Subsoil.....	36.8	5.4	20.1	13.5	9.1	12.4	
Carrington Silt Loam. East of Grange Corner two miles.	Soil.....	3		.4	6.2	4.4	86.2	
	Subsoil.....			.1	4.6	21.6	72.7	
Wabash Silt Loam. One-half mile Southwest of Howard.	Soil.....			.5	2.1	2.3	94.7	
	Subsoil.....							
Wabash Gravelly Loam. East of Rockville, west of pumping station Small area.	Soil.....	9.8	.7	6.0	20.5	22.2	38.2	
	Subsoil.....	7.0	1.1	5.46	19.5	31.0	34.3	
Knox Silt Loam. West of Grange Corner, 2¼ miles.	Soil.....		.1	.7	2.1	26.1	70.2	
	Subsoil.....			5.5	15.9	17.3	60.0	

## WABASH TOWNSHIP.

A variety of soils are found in this township, as a glance at the map will show. The bottom lands of the Wabash River and Big Raccoon Creek are very productive. The second terrace of the Sioux sandy loam produces enormous crops of corn, wheat and other crops. The soil is loose and easily worked. The uplands are of the Knox silt loam soil. The hills about Mecca contain a great deal of sand, indicating a moraine. Streams flowing out from the front of the glacier are responsible for these sand deposits. Mecca is the only town in the area. Mecca drain and sewer tile made from the deposits of shale and clay at this place are favorably known in several states. Excellent clay and shale deposits are being worked on either side of Big Raccoon at Mecca. At one time a great part of this township was an Indian reservation.

Southeast of Montezuma, about one and a half miles, on the north side of Big Raccoon Creek, a small group of houses marks the position occupied by the army of Gen. W. H. Harrison in the fall of 1811. The army remained here long enough that a small

village started. The site was afterward called Armiesburg, since the army had encamped here. General Harrison was on his way to quell Tecumseh's outbreak, which ended in the battle of Tippecanoe, November 7, 1811. General Harrison had marched from Vincennes along the eastern side of the Wabash, crossed Big Raccoon and camped. From here he marched west, crossed the Wabash and continued his march on that side of the river. He left the old Indian trail he was following, which led through dense forests in many places, as he feared an ambuscade. The other trail, the one he followed, was through more open country.

#### ADAMS TOWNSHIP.

This township is centrally located, has the largest city, which is also the county seat. The upland soil is of the Knox silt loam type; the bottom along Little Raccoon is the Wabash silt loam. Northwest of Rockville a short distance there is a small area that is darker, in color approaching the Carrington silt loam type, but the area was not large enough to separate.

The State Tuberculosis Sanitarium is located in this township, three and one-half miles east of Rockville. The grounds and buildings are sanitary in every respect and every help possible is afforded the patients for a speedy and permanent cure. The rules of the institution are very strict and are rigidly enforced. The patients who will not obey the rules of the institution are requested to leave at once. Rest, pure air and wholesome food are the essentials sought in the cure. Medical treatment is given when the patient is in need of it. Regularity of habits, especially rest and sleep, are encouraged, in fact required by the rules of the organization. Spitting upon the grounds and about the buildings by sufferers of tuberculosis is punishable by dismissal. Great good is being accomplished by the Indiana State Tuberculosis Hospital.

Parke County poor farm is located in the northwest portion of the township.

Ref. Atlas of Parke County, 1874. By A. T. Andreas:

“Rockville was laid out in the fall of 1823, and became the permanent county seat of Parke County in 1824. Previous to that courts had been held in Rosedale and Armiesburg. The donors of the land on which Rockville is situated were the first settlers of the town. The circumstance of a large number of rocks of the boulder description lying on the site, gave it the name of Rock-



ville. It is said that the name was dedicated by breaking a bottle of whisky on one of those bowlders. Be that as it may, the article was not prohibited in those days, nor was there any conscientious scruples about taking a 'dram.' It was a common civility to friends and visitors to set out the decanter or bottle and invite them to help themselves.

"Andrew Ray built the first house, which was a log cabin, situated on the public square. It was a place of entertainment for all land hunters in this section of the county. He also built and opened the first tavern in the place, in 1824.

"Being an inland town, some eight miles from the Wabash River, and accessible only by bad, muddy roads, the growth of Rockville was quite slow for many years, as was the surrounding country."

Rockville today has a population of nearly 2,000. Many fine residences and business houses show that energy and push are the characteristics of its citizens.

#### WASHINGTON TOWNSHIP.

The major part of this township is composed of the Knox silt loam type of soil typically developed, especially in the vicinity of Marshall. When natural drainage is good, not excessive, the soil is friable, loose and open textured, soft and flour-like to the touch; few if any iron concretions on the surface. The lowlands south of Judson furnish fields of corn, wheat and hay in abundance. Glacial bowlders are scattered over the surface of the land between Judson and Guion, west of the railroad and on the uplands.

One mile north of Marshall the water from a weak spring has been piped to a cement trough at the side of the road. In regions where springs abound more attention should be given to furnishing the public highway with these conveniences. The public appreciates these seemingly little things. The township should furnish the cement without hesitation and the remainder of the work would no doubt be gladly supplied by men living near the spring to be improved.

West of Marshall three-fourths of a mile, there is a depression in the land presenting very much the appearance of an old valley. Its outlet apparently was to the southwest by way of Leatherwood. Some black soil near the center of the area indicates that it was swampy for a long time. At the north small tributaries to Roaring Creek have cut through the higher rim. One explanation for

its presence is that during the glacial period a mass of ice was buried here and after the retreat of the glacier the mass of ice melted leaving the surface of the land lower here than in the immediate vicinity. This would account for the area being a lake and swamp for a long time. During that time decayed vegetable matter accumulated, which resulted in giving the soil the dark color. When the area was drained by encroaching streams it was in condition for habitation by man. The C., H. & D. Railroad passes through this depression. From the rim of the area the depression has the appearance of an old wide valley to a stream, but on entering it the observer finds there is no stream present. The basin is probably of glacial origin rather than the result of stream action, as one would conclude at first consideration. Basins of this kind are common in moranic areas.

#### SUGAR CREEK TOWNSHIP.

In this township the Carrington silt loam type of soil is typically developed. The area is not of great extent, but the only area large enough to separate. The price of land is not as high here as it is in other places where this type of soil is represented. This can be easily accounted for since the area is so distant from railroad accommodations. Land sells at from \$100 to \$125 an acre. The area is located east of Grange Corner, in the northeast corner of the area.

Much of the land in this township is rough and cut up by tributaries to Sugar Creek. It is good land for pasture if cared for properly. Land slips are abundant and are evidence that removing forest growth encourages land erosion. Something must be done to hold the soil in place or it will be wasted away by stream action. An attempt should be made to get a sod covering to the soil that is now exposed and where gullies are now starting. Sweet clover holds tenaciously the soil within its grasp, as its root system is enormous. This plant promises to be the great redeemer of waste lands. It stops gullying and enriches the soil. Sweet clover should find a welcome place especially on every hilly, rolling or wornout farm.

A little bottom land is found along Sugar Mill Creek and Greens Creek. Coal banks in sections eight and nine furnish coal for local consumption. The coal is of good quality, burning to a fine ash, producing no clinkers, but giving a large amount of heat. Along the southern boundary of the township many glacial bowl-

ders are scattered over the surface. Several good gravel pits are found also in the southern part of the township.

Grange Corner is the only town in the township.

#### LIBERTY TOWNSHIP.

In this area is found a modification of the Knox silt loam. It is whiter in color, more compact, and iron concretions are found on the surface and scattered through the soil. These present in a soil indicate need of drainage and aeration. With proper drainage and with air in the soil these pellets of iron will disintegrate, mix with the soil and give it a darker color. It will then be a typically developed Knox silt loam. The area has been mapped in as Knox silt loam, since it is a modification of this type. The Wabash silt loam of this area is very productive. Corn is the principal crop grown. It is seldom that a crop is lost by high water. The first terrace or bottom land is for the greater part owned by large landowners and rented to tenants. Grain rent is the method usually practised.

In ordinary seasons raising a crop of corn in the river bottoms is not a difficult task. The ground is listed, followed by the planter. When the corn is up large enough to cultivate, sometimes the ordinary cultivator is used; again, the sled disc cultivator is used to push into the furrow a little of the dirt of the ridge at each side of the row. This covers all weeds starting to grow. This method of cultivation predominates.

The dune-like ridges of sand appear in this township on the uplands, bordering first bottoms. At Howard water stands in wells within four or five feet of the surface in wells seven or eight feet in depth. Those who live in this community say that some places wells may be dug very deep but no water is found. In other places at six or eight feet abundance of water is found. This is explained in this way: In some places at a depth of a few feet a layer of hard blue clay that is impervious to water is encountered. It even comes to the surface in places. It is lenticular in shape, with the convex side down, very much as if a huge saucer was set deep in the sand, its rim extending to the surface in places. This saucer-shaped layer of impervious clay holds the water, furnishing wells in this area with plenty of water. Wells then outside of this area must reach great depths to find water.

East of Howard there is an elongated hill occupied by the Ephlin Cemetery. There is also another smaller mound east of

this one that may deserve comment, on the west bank of Mill Creek. Some have attempted to trace their origin to the work of Indians or the Mound Builders. This is not necessary at all, for a little study will convince the observer that they were once a part of the uplands to the west, as they have the same structure. The meandering Mill Creek has cut away that which is valley now and these knolls were points encircled by the crooked stream. When the stream completed its crookedness to that point that the channel cut through its bank the oxbow was left, the mound was left and the stream had a straighter channel. Since the stream abandoned the oxbow to the west of the graveyard, soil has washed from the uplands and from the ridge until to the untrained eye no remains of a former stream channel is present. The other knoll has been separated in a similar manner.

Coal Creek and Mill Creek have worn their channels through these sand ridges. Some small, rich, black spots or depressions, once ponds, north of Tangier and probably in other sections of the county, now drained and farmed, have been a source of discontent with many farmers. Farmers call them alkali spots. The best treatment for these areas is underdrainage, and the application of barnyard manure, straw, cornstalks, or any other rough material.

About one mile west and one-fourth mile north on the section line in a deep ravine a layer of glacial pebbles are exposed. They appear immediately above a layer of hard blue clay. This condition can be traced up the ravine for quite a distance, when it finally disappears beneath the hill. The mass of glacial till above this layer is twenty to twenty-five feet thick. The coarse mass of glacial boulders are in a layer of one and one-half to two feet thick, with huge boulders scattered here and there in the ravine. One large, massive limestone boulder, coarse, blue and fossiliferous, was found associated with the others of igneous origin. It contains about two cubic yards. Many of the rocks are deeply striated.

About a mile south of the Coal Creek bridge, at Waterman, there is an exposure of shale along a small ravine, very fossiliferous.

#### PENN TOWNSHIP.

In many ways this is a very interesting township. Much attention is given to dairy and truck farming. It boasts of having within its boundary one of the largest, if not the largest dairy barns in the county. The barn is located one-half mile west of

Annapolis. Silos are conspicuous features in this township. In fact silos are getting a place on every farm where progressive agriculture is practiced. Farmers who now have one silo, as their business allows build another. When once a farmer knows the value of a silo by actual experience he is silo promoter ever after.

One farmer in the northwest part of the area made good use of the water from a spring that flows through a bottom field. In the middle of summer when the soil is dry he makes irrigation ditches that carry the water to various parts of the field. First the stream is allowed to flow through one main stream and its divisions to one part of the field, then transferred to another main trench and its division to another part of the field. Thus the stream is swung back and forth in this manner, keeping all parts of the field supplied with moisture. The changes were made every two or three days. The corn showed clearly the effect of this treatment. This unique plan of conserving the natural resources should be made use of by others. The spring that furnished the water for this project flows, as shown by actual weir measurements, a head of water one and three-eighths inches deep and three inches wide, or at a rate of fourteen and one-half gallons a minute. This in twenty-four hours would be 662.5 barrels. A small concrete dam at the end of the hollow could be erected at small cost, then the entire field could be watered. There are probably other conditions in the county that could be handled in like manner.

On the south side of Rockport bridge, west of the place where once stood the Rockport mill, a small spring finds its way to the surface, on the south side of the road. It crosses beneath the road and loses itself in the sandy bottom land below. It flows 13.7 barrels a day during the driest summer. This would be an excellent place for a public watering place. A concrete trough here would mean much to the locality and be a great convenience to the traveling public. It is located on one of the main roads of the county, and if possible should be improved. If the material was furnished by the township the remainder of the work would be gladly donated by men living near this place.

A gravel pit containing material above the average quality for road purposes is located on the farm of Mr. Morgan, one mile east of Rockport bridge. It contains calcium carbonate in great quantities which act as a cementing material. It binds the gravel together with such force that masses of great size must be thrown aside because they cannot be crumbled. These boulders of cement-

ed gravel are evidence of the cementing power of the calcium carbonate present. When gravel from this pit is used upon the road it seems to set, forming a hard and resistant road, one that packs quickly and stays solid through the dry summer season. It does not pick up, forming "chuck holes," as the ordinary gravel road.

One change in water courses is plainly in evidence in this township immediately southwest of Bloomingdale. The old channel of Leatherwood was southwest from Bloomingdale, through Rocky Run, down past Coloma, then west, receiving the waters of the present Leatherwood at a point no great distance from its confluence with Big Raccoon Creek. The change has been brought about by stream piracy. In Section 22, what is now the channel of Leatherwood was once only a tributary to what is now the lower course of present Leatherwood. When this condition existed the head waters of Leatherwood from Bloomingdale flowed through the shorter and older channel by way of Rocky run. But the tributary in Section 22 lengthened and deepened very rapidly until it intersected the old channel, diverting the head waters of Rocky Run. The upper course of the beheaded stream filled, forming a lake or pond. Later Rocky Run cut the lower rim lower, as it slowly deepened its channel, draining the area. Probably old Leatherwood's water had become sluggish and slow, wearing its channel very little, while the pirate stream was active, with swifter current and greater power to deepen its channel. The bed of this stream being more easily eroded. The tributary then on reaching old Leatherwood diverted the head waters through its new and present course.

Bloomingdale, located on the C., H. & D. Railroad, is the principal town of this area. It has a canning factory that uses great quantities of corn and tomatoes. A large clay factory that makes a variety of earthenware is situated immediately west of Bloomingdale. The clay used by this plant is unexcelled any place in the State. Several earloads of clay are shipped from here each year.

Coke Oven Hollow, two and one-half miles west of Annapolis, has been famous for years for its fine quality of potter's clay. The plant at Bloomingdale gets its supply from this pit.

Bloomingdale Academy, one of the oldest institutions of learning in Parke County, is located at Bloomingdale.

The prevailing soil type of this township is the Knox silt loam. The extreme northern portion is very rough and broken, being cut

up by Sugar Creek and its tributaries. In the uplands bordering Sugar Creek are small patches of sand here and there, changing to gravel in places. A mass of bowlders of glacial origin, northeast of Annapolis about three miles, immediately above the Cox Ford bridge, show the position of a moraine.

The great number of silos already in use and the still greater number being erected in this as well as in many other parts of the county are evidence of thrift, enterprise and progress of the Parke County farmers.

#### RACCOON TOWNSHIP.

This township lies wholly within the Valley of the Raccoons. The wide fertile flood plains of Big Raccoon Creek produce abundant crops of corn and wheat. Alluvial flood plains in recent years do not receive the fertility and richness of deposits as in former years. The uplands have been stripped of their richness by years of erosion until now, although the weathering continues, no fertile soil is left to be carried to the larger streams and be deposited as alluvium. But as scientific methods of agriculture are practiced and the original fertility of the land is approached, alluvial plains will also increase in fertility.

The hills in many parts of the township contain great quantities of gravel of good quality. A water power mill is located at Bridgeton.

#### FLORIDA TOWNSHIP.

This township contains within its boundaries the valleys of three of the four largest water courses of the county, the Wabash, Big Raccoon, and its principal tributary, Little Raccoon, besides numerous tributaries to these streams.

The wide terraces along the Wabash in places reach a width of two miles. A mammoth gravel terrace extends south from Lyford to the county line. The terrace is the first above the alluvial flood plain of the Wabash. Much of the gravel is consumed for local road building, while still greater quantities are shipped to other places. The old canal parallels this gravel terrace.

Three railroads cross the township, giving its inhabitants good shipping facilities for farm products, as well as the products of the mine and pit, for great quantities of coal, shale and gravel are sent out. Finished products of clay and shale in the form of brick and tile, both drain and sewer, are shipped out of the county.

A lake occupied a large area east of Rosedale in early times. It was called "Nigger Leg Lake" in honor of an old Indian chief, "Nigger Leg," whose tribe occupied the region about the time the first white settlers came to this section of the country. It is reported that at the east side of the lake was the Indians' burying ground. From the gravel pit, said to be the burying ground, many human bones have been unearthed by men hauling gravel from the pit. The pit contains some good gravel for road material.

There is a story current concerning the origin of the lake that during the ice invasion a mammoth cake of ice was buried very deep here and that part of the ice yet remains. The ice that remains buried is still melting and is the source of the water flowing from the lake.

"Nigger Leg Lake" was in early times the best fishing grounds in the community. The lake is no doubt the remnant of Raccoon's former channel. It is now being drained by open ditches. Though it was the driest part of the summer when visited, large quantities of water were leaving it by way of the open ditches. Farm crops are gradually encroaching upon the area once occupied by the large body of water. Only a few years will elapse before the whole area will be producing abundant crops of corn, wheat and oats. The area is now called "Nigger Leg Prairie," and is partially covered with wild grass. The southeast part of the area is soft and quaking. The soil is black, in places muck. The soil auger could easily be thrust four feet into the soil with one hand. This does not represent the depth of the soil, only the length of the auger.

Immediately to the southwest of the lake the Knox sand sets in. To the north the lake gradually passes into the Raccoon bottoms.

North of Jessup a small area of second bottoms is found, but was mapped as first bottom, the area being small and the soil being very much like the other.

Rosedale is the principal city of this township, with a population of 1,166.

The area in the Wabash River bottom, mapped Knox fine sand, is adapted to melons and truck farming. During the high waters of the spring of 1913 only a very small portion of the highest points of this ridge were above water. The houses are situated on the highest points of this ridge, but even then some dwellers were forced to move in boats to their neighbors' as the water encroached dangerously near the buildings. All the lower ground to the east



of this ridge to the uplands, a distance of a mile, was covered by water to enormous depths.

A field of hairy vetch, winter variety, was sown in the fall of 1913 south of Rosedale. It should be watched by farmers living on this type of soil, as it is in need of organic matter. The plowing under of green crops and the addition of barnyard manure will add materially to the productivity of the soil.

#### RESERVE TOWNSHIP.

The township contains some of the richest alluvial soils that the Wabash River enriches throughout its course. The Wabash silt loam of Liberty Township changes in Reserve almost to the Wabash fine sandy loam. This is due wholly, probably, to one factor. Sugar Creek enters the wide Wabash Valley immediately north of West Union, in the northern part of the township. When the Wabash is within its natural bed, Sugar Creek follows its ordinary course to the river, but in times of flood, when the waters of the Wabash cover the first terrace, the channel of Sugar Creek is shortened from one-half to three-fourths of a mile. The swift current of Sugar Creek entering this great mass of water in the lowlands, is checked, being forced to give up part of its load. The heavier or coarser material is deposited near its channel. The finer material carried in suspension will be deflected by the waters of the Wabash and carried southward down its course. As the water of the bottoms are quieter than in the main current, this material will be deposited, giving the area a layer of sand, silt and clay.

The channel of Sugar Creek, in Parke County, to the mouth of Rush Creek, has been worn very deep in massive sandstone. The tributaries to Sugar Creek flow through glacial deposits carrying gravel, pebbles and boulders, besides silt, sand and clay. These are the tools the stream uses in cutting its bed wider and deeper in the massive sandstone. This accounts for the great load of sand carried by Sugar Creek on reaching the Wabash. Only a part of the sand and silt lodges on the immediate lowlands, greater quantities being carried long distances before being deposited.

The second terrace, of the Sioux sandy loam type, has a width of two miles in places before the upland is reached. The second terrace road from the county line on the south, to West Union, is one the traveler will long remember. Looking down over the lowlands toward the river the traveler will see green fields of pasture

and growing crops. The glistening rails of steel of the railway, keeping pace with the traveler, the haze in the distance, make up a scene so entrancing that one with any romance in his life will ponder, dream, awake and exclaim, beautiful!

Montezuma is situated on the Wabash River on the edge of a river terrace. The uplands to the east, being nearly one and one-half miles, mark the eastern boundary of the old Wabash River channel. Montezuma has a population of 1,537.

Reserve Township has two railroads, the Chicago & Eastern Illinois and the Cincinnati, Hamilton & Dayton. Great quantities of gravel are loaded and shipped from near the junction of the two roads east of Montezuma.

Along Rush Creek, about one-half mile north of the C. & E. I. Railroad bridge across Sugar Creek, a blue, fossiliferous limestone is exposed. Outcrops along the creek show a thickness of seven or eight feet of the limestone. The stone would make excellent road material and at the same time produce a good quality of limestone for fertilizing purposes. The limestone is covered only by a thin layer of soil and in much of the area soil is entirely absent. Shipping facilities are first-class, for the area is immediately along the C. & E. I. Railroad. The area of this description covers forty to sixty acres. Great quantities of the stone would be consumed in the immediate locality, as there is not only a need of limestone as a fertilizer here but a large demand for it. As valuable as the stone is and as much need as it is on the soil of the county this region should be worked.

#### HOWARD TOWNSHIP.

Howard Township lies almost wholly within the Sugar Creek drainage basin. It is located in the northeast corner of the county, joining Fountain County on the north and Montgomery County on the east. Except in the extreme south and southeast portion the area is rough and broken. Blackberries of fine quality grow wild. A great amount of the area that is rough is covered with a heavy growth of underbrush; a few scattered trees of medium size remain, the majority of the native trees have been removed. Surface erosion is held in check by the heavy undergrowth. Should this be removed, land slips and gulying would work havoc among the hills. But some of the land should be cleared enough that blue grass could get a hold on the soil and also furnish pasture. In this way some returns could be got from land at present almost profit-

less. Sweet clover of the white blossom variety could be sown in the more open places to check the gullying, enrich the sterile soil and furnish excellent pasture.

Two miles west of Byron, on Kellar's Branch, there is a small knoll probably thirty feet high. It has steep slopes on the east and south slopes, but the other sides are such that the summit could easily be reached by a team and wagon. Large granite and sandstone boulders partly buried in the soil occupy the steep slopes. The main body of the knoll is made up of gravel, sand and loam; the sand predominates. Some think it an Indian mound and contemplate searching the interior for Indian relics. Kellar's Branch flows on the east and south sides only a short distance away. Its presence here is only the result of stream meander. It has been given the name of Potato Hill.

The soil in the southern portion of the township is of the Knox silt loam type. With proper methods of cultivation good yields of corn, wheat and other farm products are harvested. More clover should be grown. Limestone is needed to sweeten the soil and give it a looser texture.

In the northeast portion of the township, along Sugar Creek, is the remains of what was once a favorite summer resort, known as Pleasant View. It is very favorably surrounded by scenery so characteristic of Sugar Creek. Refreshing springs of cold, clear water, gorges, deep and narrow; high cliffs of shale and sandstone, the old mill, fine shade, and rest grounds are some of the things so attractive about these grounds. Thousands of people visited this romantic spot each year. There was plenty of water for swimming and bathing. Immediately below the dam was a deep hole for those who wished to do deep diving. A pontoon bridge across the quiet waters above the dam made the eastern shore easily accessible. Much amusement accompanied each crossing, as the bridge rocked to and fro, up and down, as each company of young people crossed and returned.

With a concrete dam across the creek at the place the old log dam formerly occupied, cabins to replace those gone, fountains erected, and other attractions, this place could be made second to none in this section of the State.

Turkey Run is one of the most attractive summer resorts at present in this section of the country. It is visited annually by thousands of pleasure seekers. Some come to spend one day, and some to spend weeks. The camping grounds are favorably located,

with plenty of water, shade and swings. The mammoth giants of the forest, the poplar trees, scattered here and there, are worth seeing, even though there were no other attractions there. From these, the younger generation may get an idea of the enormity of trees that made up the primitive forests of this country. Rocky Hollow, as the name indicates, is a rocky hollow, and more, it is a series of hollows. Small tributaries to Sugar Creek flow through narrow gorges, wide amphitheatres, and deep canyons cut through solid walls of sandstone. Jumbled masses of rock that have fallen into the valleys, dripping waters from the ledges, noisy streams rushing down their narrow channels, make the scene enchanting. The Hollow is on the north side of the creek, the Run on the south side of the creek. The two are connected by a small suspension bridge. Many automobile parties from Danville, Ill., and various other distant cities visit Turkey Run each season.

The broken area of this township as well as others in the rougher areas is of the Knox silt loam type. In places where the top soil is not protected, erosion has removed much of the top soil, leaving the subsoil exposed. At first notice one would classify this soil in some other soil group. As the larger stream channels are approached the natural fertility of the soil decreases. But with proper tillage, selection of seed and correct crop rotation, the land produces abundantly. Sweet clover or some other legume is important in regaining this class of land. The root crop of sweet clover is immense, and it stops washing of gullies. Land sown to sweet clover improves rapidly because the roots die every two years, adding humus to the soil.

#### GREEN TOWNSHIP.

Some very rich soil is found in this township. In the north-east portion of the area some black soil occupies depressions that were once swamp lands. Underground drainage has converted this region into productive fields. The area was mapped as Knox silt loam, there not being sufficient black soil to separate. Southeast of Parkeville two and one-half miles there is another area in which natural drainage is poor and some black soil is found. It has the appearance of Carrington silt loam, but areas were too small to separate.

Some limestone in this township is very suitable for fertilizer. When ground and applied to the fields at the rate of one and one-half to two tons to the acre a forward step in the restoration of

the natural fertility of the soil has been made. Two railroads cross the township, giving the farmers good markets for their grain and livestock. Little Raccoon with its tributaries drains most of the area.

#### UNION TOWNSHIP.

The best farming land in Union Township is situated in the northwest portion. The farms about Bellmore are of the Knox silt loam type. Farms are improved and well kept. The central part of the township is rough, being cut up by Big Raccoon Creek and its tributaries from either side. Outcrops of sandstone and limestone are found along the main stream and adjacent regions where the tributaries have cut deep enough to expose them. The limestone has been quarried some for road material, giving very satisfactory results. The stone contains iron pyrites, commonly called fool's gold, for so many times has it been mistaken for gold. In the limestone that has been exposed to weathering for some time the softer parts have been worn away and left the hard resistant pyrites standing out, and has much the appearance of a rosette. The small cubes of pale brass yellow that make up the group were responsible at these local quarries for much controversy.

The bottom lands along Big Raccoon Creek are not wide but very fertile and productive. Ferndale, Bellmore, Hollandsburg, and a part of Portland Mills make up the little towns of this township.

#### JACKSON TOWNSHIP.

Jackson township is situated in the southeast corner of the county. The southwestern portion of the area is level to rolling. The soil is a light gray to ashy white color, easily worked when in proper condition. Much of the land needs draining, as in moderately wet years crops suffer greatly from this cause. Knox silt loam is the prevailing type.

Big Raccoon Creek and Rocky Ford with their tributaries have cut the northern half of the township into numerous valleys, leaving it in a very rough condition. One problem the farmer of this region is confronted with is the rescue of this land from the ravenous work of streams. As the forests are cleared away erosion gets a better chance to work, gullies are developed and grow to enormous size in a relatively short time. The hills should be covered with sod to prevent waste. A heavy sod of bluegrass will prevent washing. Sweet clover is an excellent soil preserver, as

the root system is enormous. It stops the gullies from forming, checks those already started, furnishing excellent pasture all the while.

Mansfield, a little village situated on the west bank of Big Raccoon Creek, is of interest because the famous Mansfield sandstone is typically developed here and received its name from the little town. Considerable gravel of good quality is found in the bed of the creek just below the mill. The uplands along Big Raccoon contain some good gravel. The tributaries during flood erode the adjacent hills, bringing in a large amount of gravel, depositing it in the bed of Raccoon. Much sandstone outcrops along Raccoon and its tributaries in this township. The quarry just north of Mansfield when in operation shipped great amounts of this stone.

The soil of this township needs a good dressing of limestone. The land has been depleted of its original store of its acid neutralizing qualities, and an attempt to restore this condition is sought in the use of ground limestone. The bacteria of clover will not thrive well in an acid soil. Without a legume in the crop rotation the soil will fail in a short time to produce other crops. Sweet clover as a soil builder is unexcelled. The sweet clover plant grows wild along the public highways in many places. Until recently sweet clover has been termed a weed. But recent study and experiments with the plant shows it to be a very valuable weed.

In rolling to hilly areas where erosion is cutting and wasting the fields with gullies there is no better holder of soil than sweet clover. It grows and thrives well where no other plant would grow, at the same time stopping the waste of the land. In regions where there is a tendency of the soil to drift sweet clover holds it in place.

Many farms are going to ruin through sheer indolence. The owner, instead of being wideawake, using methods of economy and good management, is content to follow ancestral methods of farming. Inhabitants of the soil, of this class, feed fodder of stunted growth, grown upon a soil sour and clammy, to a degenerate class of horses and cattle, in a little, old, open, rickety, dilapidated barn. An invasion of this territory by men of scientific methods of farming is needed. Only by intelligent, scientific management can these practically worn out soils be reclaimed. By application of limestone, one or two tons to the acre, growing of legumes, as sweet clover, red clover, vetch (winter variety), and alfalfa. By deep

plowing and proper tillage, with protection against further gully-ing, these farms may be restored partially at least to their virgin fertility.

Sweet clover for best results should be sown in the spring with a bushel to a bushel and a half of oats, using about twenty pounds of sweet clover seed.

Some advantages of sweet clover over alfalfa are: cattle and sheep do not bloat on sweet clover; sweet clover is a biennial. The root system is immense, spreading wide and deep. Its roots die every two years, the roots form openings into the subsoil enriching it with humus and leaving nitrogen in the surface soil. Alfalfa roots do not die until the field is plowed, killing the plants. Enough seed shatters from sweet clover to keep a stand from year to year.

The white variety makes the best hay and pasture. Sweet clover is worth as much ton for ton as bran to feed dairy cows. In winter sweet clover hay is fed to hogs. Stock must learn to like sweet clover. When once a liking for sweet clover is created no further trouble about stock eating it is encountered. Experts claim sweet clover is higher in protein, ash and fat than alfalfa. It adds more organic matter to the soil because its roots die every other year. It is a better nitrogen gatherer than alfalfa and has a higher feeding value pound for pound.

A small plot of ground consisting of about one acre will furnish sufficient pasture for eighteen or twenty hogs. It should not be pastured too young. At least ten to twelve weeks should elapse after sowing before pasturing is begun. Hogs will not fatten much on sweet clover alone, but bone and muscle growth are fostered. With half rations of corn, hogs fatten rapidly pasturing on sweet clover.

Seed is difficult to buy at seed houses, as they ask enormous prices for it. It can usually be found growing along the roadside in the neighborhood.

As a soil builder sweet clover is unexcelled. Its roots penetrate the hardest soil.