

Soil Survey of Whitley County.

This county is situated in the northern part of the state, and is bounded on the north by Noble county, on the east by Allen county, on the south by Huntington and Wabash counties, and on the west by Wabash and Kosciusko counties, and at present comprises about 210,458 acres of land. It was originally composed of nine congressional townships when organized in 1838, and as fixed by the Legislature of 1833 and 1834. In June, 1859, the area was changed by the addition of twelve sections of land taken from the south side of township thirty-three north, range eight east, in Noble county. The following altitudes show its elevation above sea level and are taken from "A Dictionary of Altitudes in the United States" by Henry Garrett, viz:

Columbia City—P. Ft. W. & C. Rwy.....	839
" " —L. & T. Rwy. (Vandalia).....	829
" " —Rwy. Crossing.....	832
" " —Weather Bureau.....	841
Larwill —P. Ft. W. & C. Rwy.....	951

Larwill is west of Columbia City about eight miles and on the western edge of a most interesting moraine formation, which will be described further on in this sketch.

Whitley county was named in honor of Col. William Whitley, of Lincoln county, Kentucky, who was killed at the battle of the Thames, in Canada, in the war of 1812. Its surface is generally rolling and uneven, diversified by a few marked irregularities and only a limited area of level land. The surface configuration is due mainly to glacial action which by time was altered by erosion. The entire county, with the rest of northern Indiana, was overspread by glaciers which buried the work of the geologic ages of periods before the Past Tertiary of Cenozoic, or recent time, with a mass of drift composed of heterogeneous mixtures of ground-up rocks, mud and debris, containing boulders, gravel, sand, clay and mud in varying proportions and deposited over the entire county, as well as elsewhere, when the great ice sheet covered this section of the United States. The drift of the uplands is called boulder clay, as it is believed to be composed from the grinding up of boulder during the moving process of this great mass of

glacial ice. This clay is the most characteristic of the ice age deposits. It is a stiff clay mixed with angular and rounded gravel, boulders, and varying amounts of sand. It undoubtedly has been modified on the surface, to a great extent, by the action of water, frost and disintegration. In the valleys the drift shows clearly the assorting agency of running water. The drift boulders are representative of the metamorphosed granites, gneiss, etc., from the north; and representatives from the original bed-rock and the different ages of geologic time are found also. The deposits of the drift material vary in thickness but may be about 220 feet in portions of the county as determined by deep well borings. In its physical conditions, or Ice Age make-up, Whitley county is very interesting. It occupies a portion of the great Saginaw-Erie moraine, and the crest of this moraine, forming the divide or water-shed between the Tippecanoe river and Eel river drainage systems of Indiana, passes through the northern part of the county. The greater part of the county is on the Eel river side of the moraine. Perhaps nowhere else in the northern part of Indiana does the surface of the drift present features so strongly marked and contrasted in character.

In the townships of the south and southeastern part of the county the surface is best described by saying it is flat or level except that portion in the extreme southeastern corner near the site of the old Wabash and Erie canal. Here the surface is much broken, equal to the most ragged parts of the north and western portions of the county. In this flat or level portion of the county the surface is sufficiently sloping for drainage, but this can only be determined by the general course of the streams. The surface of this part of the county resembles that of a large sheet of wrapping paper which has been wet and then dried, the depressions and elevations having very little relief and no defined boundaries. The only relief from unbroken monotony is afforded by the channels of the streams. This area had many marshes but these have now all been reclaimed by systems of drainage, and show their location only by a slight depression and no definite margin as they would on more rolling surfaces. The swamps here were not of the muck type as they are in the broken areas. But few boulders are contained in this soil which is a part of that enormous mass of mud which settled quietly to the bottom from this great sheet of ice, and is designated as ground-up moraine material to a very fine state. The drainage of this region is accomplished by several streams which flow east, south and

southwest, carrying away the waters toward the Wabash-Erie channel. Indian Creek and Big Indian Creek flow eastward and empty into the Aboite Creek in Allen county. Calf Creek and Clear Creek flow south through Huntington county, emptying into the Wabash or Little River. Sugar Creek and Stony Creek wind sluggishly westward to Eel river, carrying the waters from the northern part of this level area. Nearly all of these streams have been opened by dredges and are now classed as county ditches. Small and almost imperceptible ridges form the watersheds between these streams.

The northeastern quarter of the county and the entire western side has the general and usual features of morained surfaces called crumpled. A portion of the western side is unique and will receive special notice. The northern part of the county presents a distinct morainic crest extending in the main from northeast to southwest. South of this ridge the surface is divided by other or secondary ridges, with valleys between through which flow the waters of Blue River and its tributaries in a southwesterly direction and emptying into Eel River near the center of the county. Eel river entering the county from Allen county flows in a southwesterly course and forms the main drainage channel of the county. These rivers and their tributaries have been deepened and straightened by dredging almost through the entire county. Eel river flows through a rich and beautiful valley, varying in width not exceeding a mile. The slope on either side being gradual and comparatively without bluffs except along its upper course. In section one, township thirty, range eight, two very curious depressions extend back from the river into the hills. One is narrow and about a half mile long, the other is smaller and separated from the first by a narrow ridge like a canal tow-path. These depressions, undoubtedly, at one time were small lakes.

In a part of Columbia township and part of Richland township is a tract of glacial formation which is difficult to describe, and in doing this I can do no better than quote from a local history, viz: "The country is entirely occupied by deep, irregular, elongated valleys with narrow, sharp winding ridges between, all in inextricable almost confusion. In a somewhat extensive study of the great morainic belts of North America, by personal observation and published reports, Prof. Charles Dryer says he has never seen or found described anything nearly resembling this area. It covers in all about forty square miles and the greatest distance of level probably does not exceed 100 feet, yet this little

patch of the earth's surface is unique. The roads through it were originally very crooked to avoid the marshes, and, though somewhat improved by drainage and good graveling, will always remain of the crooked type. In whatever direction one travels, it is one continuous succession of steep descents and ascents. The ridges are composed of rather barren clay and the valleys occupied originally by marshes and tamarack swamps. The relief might be imitated by taking a block of plastic clay and gouging it with some blunt instrument in the most irregular manner possible, somewhat as the ancient Babylonians did their brick. It is one of nature's cuneiform inscriptions, and as difficult of interpretation as those of the Euphrates valley. This type of topography may be called chasmed. It is now impossible to imagine with any definiteness of detail the process by which this little bit of the face of the earth was put in its present shape. Another strange peculiarity is that a country which so abounds in depressions is almost devoid of lakes. This condition continues to and beyond the west line of Richland township to about the center, north and south, or the entire west side of township 31, range 8.

Black Lake, section 27, and Wilson Lake, section 32, range 8, lie upon the northwestern border of this region. The former originally covered about forty acres, is shallow and almost free from vegetation. An unusually high and precipitous ridge separates the two. From these lakes Spring Creek flows southward through the chasms to Eel river near South Whitley. North of the middle of Richland township, the surface smooths out, decidedly retaining similar features in a much milder form, and may be called gently sloping. This comparatively smooth interval extends westward nearly to the county line, and to the north occupies the greater part of Troy and Etna townships. Although the contrasts between the precipitous chasms on the east and the gentle undulations on the west is very strong, it is impossible to draw more than an approximate line. The village of Larwill is situated upon this boundary, which extends thence southward and southwest and toward the northeast, passing between Loon and Crooked Lakes."

LAKES—STREAMS—DRAINAGE.

The surface of the northern part of the county is interspersed with a chain of lakes which can challenge comparison with any other group of Indiana lakes for beauty and attractiveness, and interest to the sportsman and student of Botany. Blue Lake in

Smith township occupies portions of four sections and is of unusual interest as a resort. Shriner, Cedar and Round Lakes, known as Tri-lake is as pretty a group of lakes as anyone can wish to see. Shriner and Cedar occupy valleys running parallel and separated from each other by a ridge about a quarter of a mile wide upon which are built beautiful cottages and a hotel. This is Tri-lake resort. This ridge is low at the west and precipitous near the east end. Cedar and Round Lakes occupy the same valley and lie north of the ridge. Catfish Lake lies at the western end of Shriner Lake, in the same valley, from which it is separated by a low ridge about 36 rods wide. These lakes and their watershed surroundings all drain their excess water through one stream running south emptying into Blue River, which is also the drainage outlet of Blue Lake and surrounding watershed; all belonging to the Eel river drainage system. Crooked Lake lies to the west of Cedar Lake and separated from it by a distinct ridge or crest which forms the watershed between the Tippecanoe and Eel river drainage systems. The surface around these lakes is rather elevated and the banks in places are quite precipitous. Loon Lake, Goose Lake, Winter Lake, New Lake and Old Lake form an interesting group to the west of the Tri-lake group. The four latter lie in one valley, north and south, and separated only by low ridges. Loon Lake is in a parallel valley to the east. The two valleys are separated by a ridge probably one half mile wide. All of these drain northward into the Tippecanoe drainage system. Big Cedar, Robinson, Black, Wilson and a number of very small lakes comprise the lake system in Whitley county. Big Cedar, Robinson and some small lakes drain westward out of this county. Black and Wilson Lakes, as has been mentioned, drain south through Spring Creek into Eel river. The northwest portion of the county, not included in the lake drainage, is drained wholly by small streams or ditches which carry the waters westerly and northward into streams connected with the Tippecanoe system. Outside of the lake drainage described, the balance of the county is thoroughly and systematically drained by natural streams, which, with a few exceptions, have all been straightened, deepened and improved by dredges, so that now they are only artificial streams occupying the original creek and river valleys. These have practically all been mentioned in the topography of the county. The streams of the county, with but few exceptions, flow in a general southwesterly direction into the Wabash River using Eel river as a conveyor.

GEOLOGY.

Two different places show the drift to be about 220 feet in depth. It is tantalizing to think that within 220 feet of the surface is an abundance of fine and durable building stone of unlimited quantity yet practically so distant that it is useless for any known purpose at the present time. It may be a storage room for something to be utilized at some future time. Scattered throughout the drift, except in the flat portion of the county, as described in the topography, in varying quantities is an abundance of granite and other boulders; these are used extensively for foundations for buildings. Conglomerates, quartz and rocks of varying compositions are scattered throughout the drift especially so on the ridges. A boulder belt can be traced from section 34, Smith township, in a southwesterly direction to section 32, Union township, both townships in range 10, beyond it is not noticeable. Its extent is about seven miles in length and from one-half to one mile in width. This belt of boulders is very noticeable, having well defined boundaries. The boulders are principally of granitic formation, varying in size from small to very large—as much as six feet in diameter. Along the axis of this belt were it extended southward toward Huntington, in Huntington county, until it intersected with the boulder region there, several pronounced boulder localities would be encountered, one of which is in sections 35 and 36 of Washington township, or townships 30, range 9. I give this as a probability, not as a fact, that perhaps there may be a boulder belt of immense size extending from the above continuously to the Wabash river and continuing along the course of that river. Peatbeds are found in many places; and bog-iron ore is also found in several localities. However neither peat nor bog-iron are found in sufficient quantities to be of any consequence otherwise than an interesting geological item. Nearly all the lake beds and many of the beds of its muck swamps contain an abundance of marl which, at some future time, may be a source of much wealth. There is an abundance of clay soils from which brick and drain tile of the finest quality are manufactured. There are different qualities of this clay, and the supply of it is almost unlimited and liberally distributed over the entire county. Sand and gravel ridges are located here and there over the entire county, and especially so in the valleys of Blue and Eel rivers in abundance. Some deep beds of gravel are being worked in various places in the low lands of level areas from which the

gravel is lifted with machinery. The sand and gravel from these ridges and deep beds is utilized in the building of highways, streets, and concrete work of all description. This material is all of excellent quality and unlimited in quantity.

AGRICULTURE.

The surface soils represent nature's patchwork of variety, and all are well adapted to grazing and tillage. All the agricultural crops adapted to this climate are cultivated. Cattle, sheep and swine form the animal products of the soil. Dairying, also allied with soil conditions, in recent years is making rapid progress. Some horse are raised, mostly for domestic purposes. Fruits can be grown in abundance when given the proper care.

SOILS.

The real source of wealth in this county is the soil, and it has responded most liberally. It consists mostly of clay of different varieties which has been enriched with the accumulation of vegetable matter for many centuries. Being the result of the Ice Age, it is naturally fertile in mineral constituents and responds most liberally when handled with proper care. Some areas are sandy in varying proportions, but these are not extensive. The level part of the county is made up of the finer or mud particles of the drift debris and is now a very rich soil. The valleys are of sedimentary formation, the ingredients being carried there by erosion of the uplands and by overflow during many ages. Here one would naturally expect to find the richest soil. There are some areas of muck, not extensive, however, which are utilized chiefly for raising onions. This character of soil requires liberal applications of fertilizers to make it productive. The clay soils require liberal applications of humus to make them friable and porous, and to liberate the plant food. Rotation of crops is generally practiced as a conservation of soil fertility.

PALEONTOLOGY.

The paleontology is represented altogether in surface finds on the cultivated fields and in the creek gravels. The specimens of fossils are of the "tramp" variety. They were brought here by the agency of the ice sheet. The fossils are chiefly interesting as furnishing possible information as to the source of the debris brought here by the great ice agency. The representative fossils are such

as are found described and classified in the Van Cleve and Hall lists of corals and shells. My own cabinet contains a generous number of coral specimens of different varieties which I gathered in going over this county. It also contains some brachiopods, crinoid stems and two trilobites found here. One of the trilobites was found in the creek gravels north of Columbia City and the other in bank gravel near South Whitley along Eel river.

NATURAL WONDERS.

The only natural wonders are the numerous sink-holes scattered across the entire northern part of the county. These are nothing more than morainic kettled hole lakes which became filled and covered over with a morass of vegetable growth during the countless years of nature's growth and change. As a rule high elevations or hills surround these holes, and a narrow valley leads from them. Occasionally a deep saucer-like depression occurs on high elevations, which, upon examination, shows that it must have been a small area of water and became gradually filled up by the accumulation of vegetable debris and washed in soil.

ARCHAEOLOGY.

Many centuries before the appearance of white people in this country, it was occupied by the Indians. When the Indians lived here nature was complete and perfect. The soil furnished him riches in abundance. The forests were complete and untouched as God and nature made them. In them the Indian found an abundance of game, which yielded him meat for his sustenance and raiment for his body. Likewise from the streams he secured fish and small furs for his comfort. In this land of plenty the Indian lived like a prince, for his wants were few and easily satisfied, his ambitions lowly, and his hopes eternal. But to all of this there came an end. There came from across the seas the white man, that "prince of parasites," the self-styled heir to all the ages, conquerer, civilizer, and also despoiler and devastator of nature. He first came as a discoverer, then as a trader and trapper among the Indians, and last as a settler, always a despoiler of the land the Indian loved so well. No country has such beautiful legendary lore as America, left it as a priceless heritage by the vanishing representatives of the prehistoric people—the Indians.

In the memory of white man this territory was inhabited by representations of the Miami and Pottawattomi tribes, chiefly by

small bands or sub-divisions of Miamis. The Eel river tribe or band were Miamis who had located on Eel river near Logansport and wandered from there up and down the river, and thus into Whitley county. The last of them, with a few exceptions, were removed in 1837. Those from Whitley and nearby in Allen and Huntington counties were loaded on canal boats at Racoon Village in the southeast corner of the county. The Indians retained four reservations in this county; Seek's Village, Beaver, Chapiene and Racoon's Village. As late as 1833, local history claims there were about two hundred Indians in the county distributed in the following villages, viz: Racoon Village, Blue Lake, Seek's Village, Beaver Reserve and Coesse's section just south of Columbia City. Chief Coesse died in 1854, and his only son is buried on the home farm near where the present farm buildings are located. His wife and daughters remained on the farm until 1868.

Situated as this county is on the Indian trail from Vincennes by way of Eel river to the Maumee, one would surely seek for some interesting Indian history. This was preserved for future generations by a number of citizens on July 26, 1906. This little band of citizens visited the Island, the spot of executions thereon, the battle ground of the two dominant tribes, Miamis and Pottawattamis, the spot of the burned cabins, Indian cemeteries, the spot of the massacre at Pages' Crossing, the bridge across Beaver Run, Little Turtle's Village, Seek's Village, and the location of the homes of both these chiefs; also the portages and trails. While doing this they also gathered and received much Indian lore connected with the history of this county. There is an absence of mounds of prehistoric earthworks, but implements of war, the chase and articles of adornment and ceremony are somewhat plentiful.

The artifacts of these people of prehistoric ages at first were very crude, were chipped only, and hardly have the semblance of being made for any special purpose. Later on they were shaped into form by chipping and pecking. Following this advancement he began smoothing and polishing his implements by grinding and rubbing them until they were things of beauty. He then, too, began making ornaments for his person. His pride for beautiful things increased with his advancement and culture. These artifacts consist of mortars and pestles, axes, celts, scrapers, arrows points, spear points, drills, perforators, hair fasteners, knives, saws, awls, pipes, hammers, mauls or mallets, rubbing stones,

and many ornaments and ceremonies. Their mortars are not so common, very few being found here. The pestles are more plentiful and this fact is conclusive that the aborigine used a cavity in some fallen tree, instead of a rock, for his mortar. The general form of the pestle is cylindrical and varies very much in size. Those in my collection vary from four to twelve and one-half inches in length, and from two to two and one-half inches in diameter. Axes, celts and flint implements are numerous and are found everywhere on our farms. These are the most interesting of all the relics we find, because they show great ingenuity in manufacture. They vary in size and form. Some are rudely finished, while others are beautifully polished and finished without a flaw to mar the marvelous beauty of the implement. The Indian must have felt proud of a fine axe or tomahawk as evidenced by the great amount of work it necessitated to make a fine one. The Indian's axe has a groove around the poll or upper part. I have two specimens that have a groove up and over the poll connecting with the groove around the axe. This type is very rare. The grooved axes found here do not differ materially from those found in other places only that they, in general, are not so large. The celt, commonly called a hatchet or tomahawk, is as numerous as the axe and shows as much workmanship and skill in its manufacture as does the axe, only that it has no grooves. The flint implements are found everywhere and nearly every person has found some of them. These consist of arrow and spear points, saws, knives, scrapers, hoes, perforators and drills. In size these run from one-half inch to eight inches long and are made from all the varieties of flint and the very finest moss agate, quartz, obsidian and jasper. These were all made away from here for the material is not found here. The most are Ohio flint ridge material, while the agates, sugar quartz and obsidian came from long distances—the agates and obsidian from the far west and the sugar quartz from Wisconsin. The axes, celts, mortars, pestles, hammers and rubbing stones were made from boulders like those scattered all over the surface of the farms.

There is another class of objects, widely different in form, but which may be classed together. Different names have been given to them which may have been based upon their appearance or upon a theoretical idea of their purpose. They are classed in general as ceremonial objects and classified as banner stones, drilled ceremonials, pierced tablets, gorgets, pendants, bird-shaped objects, boat-shaped objects, etc. Thomas Wilson in his work

says: "The names thus given may or may not be correct, but are as good as others that have been suggested in their stead. They should be retained until something more correct can be given." Moorhead in his "Stone Age" classifies them under the general term of "Problematical Forms." All of these objects are found in Whitley county, although not in great numbers. They are well polished and symmetrically formed and made of slate often beautifully banded or striped. They all have holes drilled in them. My cabinet contains specimens which are partly made and apparently were rejected or lost. These show that they were shaped before drilling commenced. The beautiful symmetry and fine-finish entitles these articles to be classed as objects of fine art.

Prehistoric man appreciated the luxury of a pipe and enjoyed the effect of tobacco. Smoking was probably his most pleasing occupation. In making his pipe and smoking tube, he displayed the greatest care and ingenuity. They were made to represent many species of animal and bird. Even the human form was outlined in his pipe. In most cases, however, he simply made a pipe which he could use and enjoy. The pipes and tubes are nearly all made of slate and red sandstone or cathinite. I have a monitor pipe of green stone found on an adjoining farm.

A few fragments of pottery were found on a farm in Thorn-creek township and near a small lake or pond. These fragments are in my collection. Copper and iron implements are sparingly found. My collection has in it a copper spear point, the only one that I know of in the county; and iron spear point and four iron hatchets. These iron tomahawks are more plentiful. Several skeletons were exhumed in the gravel banks while removing gravel for building purposes, but nothing was found with these. Badly rust eaten scalping knives have been picked up on the village sites. Two of these are in my collection.

Occasional firepits or ovens are found near the lakes and rivers. These are merely holes dug in the earth and walled up with stone.

Remains of the ancient and long extinct animals have been unearthed while ditching and dredging the lowlands. Bones of the mastodon have been found in several localities. These leviathans of the animal kingdom while foraging on the grass near the swamps of that time mired their huge forms in the soft earth where their bones have lain for untold centuries. Remains of the smaller animals of recent time are also found in the lowlands

which are being drained, cleared and farmed. Teeth of the buffalo and beaver, antlers of the elk and deer are in evidence.

In conclusion I will say that I have based the part of this article relating to fossils and archaeology upon material in my own collection. There are several collectors in the county and everything that is found is invariably placed in some collection.

JOHN H. SHILTS.

Columbia City, Indiana.