

GEOLOGICAL SURVEY OF JASPER COUNTY.

Jasper county is bounded on the north by Lake and Porter counties, on the east by Pulaski and White, on the south by White and Benton, and on the west by Newton county.

Organized in 1837, it was named in honor of Sergeant Jasper, the gallant defender of Fort Moultrie during the revolution, and then contained 975 square miles. This area was reduced to about 500 square miles by the separate organization of Newton county from its territory, in 1860. It now contains 353,206 acres taxed, of which originally about 50 per cent. was prairie, 10 per cent. good timber land, and 40 per cent. brush and small timber.

Rensselaer, the county seat, is situated on the Iroquois river, a little south of the central part of the county, 106 miles northwest of Indianapolis, and 72 miles southeast of Chicago, on the C. & I. Air Line. This is a thriving and growing town.

The only other town of any size in the county is Remington, situated near the extreme southern part, on the Logansport & Peoria Branch of the P., C. & St. L. R. R.

The Iroquois river rises near the east-central part of the county, in Newton township, within two miles northeast of Rensselaer; flows northwest, northeast, east, southeast, in a lengthened curve, to a point one and a half miles east of Rensselaer, where it is joined by the Pickamink river, and flows in a general west-southwest direction into Newton county, being joined successively by "Big Slough" and Carpenter's creeks from the south, and Curtiss' creek from the north. With its affluents, it drains over three-fourths of the county.

The Kankakee river forms the northern boundary, having a general western trend. The stream is sluggish and tortuous, and is lined with a growth of timber.

The southwestern part of this county is a gently rolling prairie, of black, loamy soil. In the northern and northeastern portions, the soil is sandy, with oak openings and slashy prairies, interspersed with sandy knolls and ridges, and is much in a wild state of nature, scarcely disturbed by the hand of man.

The whole county is underlaid by beds of bowlder drift, which vary in depth from twenty feet in the valley of the Iroquois, to nearly two hundred feet at some of the higher ridges.

RECENT GEOLOGY.

The surface of this county is from eighty to one hundred and fifty feet below the tip-top level of the adjacent beds of bowlder drift, and presents a nearly level plateau, from whence streams flow east, west, north and south; and, as is general with such water sheds where there is no marked incline in one direction, it is level, and swamps occur.

The phenomenon of the Great Ice age has eroded and removed from the entire area of the county from fifty to two hundred feet of rock, carrying away the finer and softer clays and soluble material, and covering much of the surface with sands.

A narrow extension of rocks, of the Sub-Carboniferous and Carboniferous ages, by way of Remington, reaches up in a north-northeasterly direction, to a point near to and southeast of Rensselaer, and an isolated bed of the conglomerate sandstone here exists. These strata may assist in explaining the presence of the large amounts of sand which prevail. The actual surface has been largely modified by the sifting, sorting processes of floods of water and sluice ways from melting glaciers; and as the ice receded to the north, these sluice ways, being no longer fed or obstructed, left numerous lakes to occupy their ancient channels. As in Newton county, these later lakes are now marked by swamps and ponds. The winds have built up, on their northeast and east shores, ridges of sand and traveling knolls of the same, with gentle slopes facing the direction of the prevailing winds, from southwest, and abrupt banks to the northeast and east. On the C. & I. Air Line R. R., between

Rensselaer and the Kankakee river, some of these ridges and knolls are cut through, giving good opportunities for sectional observation. They are so obscurely laminated as to prove conclusively that they were not, in such cases, deposited by lacustral or fluviatile waters, but, on the contrary, were heaped up and shaped by the action of the southwestern winds. Near the center of the county, the line of the ancient ridge which formerly separated the east-west flow of the Kankakee from the Iroquois, will afford good gravel and other material for road making. This invites attention and exploration.

It has been stated in the "Geology of Newton County" (to which reference is here made), that during the term of the east-west trend of the earliest ice flow, and which preceded the north-south flow, the valley of the Iroquois, a short distance south of its present bed, had been excavated to a depth of 150 to 200 feet below its present water level in that county. Although no definite information from deep bores was attainable, the probability is manifest that this ancient channel, now filled so deeply with bowlder clays, extends across Jasper county to near its eastern boundary, in a course north, 80° east, and when the time comes, as it "may and will," when these large areas are to be improved and made productive, the combined efforts of the two counties, supplemented by the consent of their Illinois neighbors, by opening up a new course for the Iroquois through this old channel, as more fully commented upon in the report on Newton county, will effectually drain an immense area of wet land to a depth of twenty or thirty feet, and enrich citizens of this county and the State of Indiana to the extent of millions of dollars.

The northern part of Jasper and Newton counties may be wonderfully benefited, their productions and the health, wealth and physical vigor of the people increased, by the straightening and deepening of the channel of the Kankakee river, as shown by the late able report of Professor John L. Campbell, Engineer of the Kankakee improvement. The cost of such improvement is insignificant compared with the immense benefits to be derived. After such an outlet is opened, the crop of a single year over this immense area would doubly repay the whole expense, while in the near future a teeming population, with healthful homes, school houses and churches—the muni-

ments of freedom and the Republic—will rise like magic from the reedy swamps, now inhabited by the water fowl and fish. In the longer future these dreary stretches and impassable fens will not only reward their owners with produce and wealth, but will annually repay the State and municipal authorities, at the ordinary rate of taxation, the entire cost.

Broad acres and wealth alone can not bring the full enjoyments of life and labor. Wet lands, impassible roads, are followed by weakened vitality, diminished energy; the contrary produce health, and physical and mental vigor. These again are followed by enterprise and morality. Hence every rule of reason invites energetic and successful action looking toward the drainage of these lands.

PALEOZOIC GEOLOGY.

The rocky exposures of the county show the presence of the Sub-Carboniferous, Devonian and Silurian ages. Some fragments of black slate, and even coal, are met with in wells through the bowlder clay, suggesting that once outliers of the Carboniferous age extended over this region some distance to the north and northeast of Rensselaer, since principally removed by erosion and glacial action.

A connected section, collected from isolated localities, is given:

Connected Section of Jasper County.

| | | |
|---|-------|-----------|
| Soil and loam..... | 2 to | 5 ft. |
| Bowlder drift..... | 20 to | 200 |
| Conglomerate sand rock..... | 0 to | 40 |
| Keokuk limestone and shale..... | 0 to | 10 |
| “Waverly,” or Knob sandstone..... | 0 to | 15 |
| Louisville-Delphi black slate (Genessee shale).... | 0 to | 62 |
| Devonian limestone..... | 25 to | 2 |
| Silurian limestone (exposed)..... | | 8 |
| Silurian limestone (porous with cavities filled with petroleum and gas—in bores) | | 855 |
| Total..... | | 1,197 ft. |

The highest rocks of the county occur at Pierce's quarry, on J. C. Van Rensselaer's farm, about three and a half miles southeast of Rensselaer—section 33, township 29 north, range 6 west. This is a coarse grit, the conglomerate sandstone of the coal measures. This bed shows a depth in sight of eight feet, and is an excellent quality of sandstone for foundations, piers and heavy masonry, and is to a considerable degree fire as well as weather proof. Fossils—mostly indistinct—of *Ferns*, *Calamites*, *Sternbergii*, *Fucoids*, etc., were found here in considerable abundance. The top of the bed is planished and striated by glacial action, and shows clearly the erosive force which took place over all this section during the Great Ice age. Striæ show the direction to have been from north to south from 12° to 15° east.

The rock exhibits the phenomenon so common in the conglomerate sandstone—false bedding, with faces sloping to the south-southwest, indicating the great depth of the coal measure sea, and the source of tidal waves in that direction. The coarse grains of sand and worn specimens of plants, indicate the violence of the currents and waves that beat upon this ancient shore line.

Section at Alter's Quarry, Northwest of Remington.

| | |
|--|--------|
| Chester, or conglomerate, sandstone..... | 6 ft. |
| Limestone with partings, buff colored, Keokuk group... | 8 |
| Total | 14 ft. |

List of Fossils found at Alter's Quarry.

RADIATA.

| | |
|--------------------------------------|------------------|
| <i>Zaphrentis dalii</i> | Edwards & Haime. |
| <i>Lophophyllum proliferum</i> | Edwards & Haime. |

ECHINODERMATA.

| | |
|------------------------------------|----------|
| <i>Actinocrinus lowei</i> | Hall. |
| <i>Dichocrinus simplex</i> | Shumard. |
| <i>Platycrinus bonoensis</i> | White. |

BRACHIOPODA.

| | |
|--|--------------------|
| <i>Streptorhynchus crenistriatus</i> | Phillips. |
| <i>Rhynchonella mutata</i> | Hall. |
| <i>Strophomena rhomboidalis</i> | Wahlenberg. |
| <i>Chonetes fischeri</i> | Norwood & Pratten. |
| <i>Chonetes planumbonum</i> | Meek & Worthen. |
| <i>Spirifer rostellatus</i> | Hall. |
| <i>Spirifer keokuk</i> | Hall. |
| <i>Spirifer</i>Sp. ?..... | |
| <i>Athyris lamellosa</i> | Leveille. |
| <i>Athyris</i>Sp. ?..... | |
| <i>Orthis michelinia</i> | Hall. |

At Jordan's Grove, on Carpenter's creek, occurs an exposure of irregularly bedded argillaceous sandstone, which belongs, stratigraphically, to the lower division of the "Waverly," or Knob sandstone. It was formerly quarried for local use in foundations.

A short distance further north, still on Carpenter's creek, is a bluff exposing the Genessee shale, or slate, to a depth of about twenty-three feet. This underlies the "Waverly" Knob stone, and has probably been eroded by the bowlder drift at least thirty feet. It is slightly glazed with petroleum, and some years since a bore was put down for oil, the slate being found to extend forty feet below the surface, giving a total depth of sixty-three feet.

A thin bed of limestone at Allen's quarry, about four miles west, on a branch of Carpenter's creek, gave a good quality of stone, which seems to weather well in several houses and barns which have been built of it, but no fossils are present to determine its horizon.

At Rensselaer the Iroquois flows over a bed of cherty limestone, forming through the town a series of rapids for several hundred yards. At the town the rock is unfit for burning into lime, but is used considerably for road-making. Lower down it is purer, and considerable lime is burned for local use.

A short distance above, at the dam, thin beds of limestone of the Devonian are seen in the low banks, and Upper Silurian in the bed of the river at low stages of water.

These beds are the only rocky exposures to be seen along the Iroquois in this county. The point at the dam seems to be an anticlinal axis from which the strata dip in a northeast and southeast direction.

List of Fossils Found at Rensselaer, near the Old Mill Dam South Side of the Iroquois River.

RADIATA.

| | |
|---------------------------------------|--------------------|
| <i>Favosites epidermatus</i> | Rominger. |
| <i>Favosites emmonsii</i> | Rominger. |
| <i>Favosites limitaris</i> | Rominger. |
| <i>Favosites hemisphericus</i> | Yandell & Shumard. |
| <i>Favosites tuberosus</i> | Rominger. |
| <i>Cyathophyllum rugosum</i> | Edwards & Haime. |
| <i>Acervularia davidsoni</i> | Hall. |
| <i>Cystiphyllum vesiculosum</i> | Edwards & Haime. |
| <i>Cystiphyllum sulcatum</i> | Billings. |
| <i>Syringopora perelegans</i> | Billings. |
| <i>Syringopora tubiporoides</i> | Yandell & Shumard. |
| <i>Stromatopora pustulifera</i> | Winchell. |
| <i>Stromatopora nodulosa</i> | Nicholson. |

BRACHIOPODA.

| | |
|---|----------|
| <i>Atrypa reticularis</i> | Linneus. |
| <i>Pentamerus</i> <i>Sp.?</i> | |

GASTEROPODA.

| | |
|--------------------------------|-----------|
| <i>Euomphalus decewi</i> | Billings. |
| <i>Loxonema teres</i> | Hall. |

CEPHALOPODA.

| | |
|--|--------------------|
| <i>Orthoceras</i> <i>Sp.?</i> | (In bed of river.) |
| <i>Gomphoceras</i> <i>Sp.?</i> | (In bed of river.) |

A few hundred feet below the dam, opposite the residence of Mr. Scott, is an exposure 50x5 feet, showing very distinctly the powerful action of the glaciers, the whole surface being planished and striated in a remarkable way, the lines of the striæ

giving a direction from north to nearly south. The markings evidently extend for some distance under the south bank of the stream.

Just below the mill, in town, on the opposite side of the river, and at a level at least twenty feet lower than this, similar distinct markings are to be seen over a considerable area.

At Porter's, one and a quarter miles lower down, where good lime is burned from quarries in the bed of the river, and on the banks, the rocks of the Silurian age are exposed, as will be seen from the following:

List of Fossils found at Porter's Quarry, one and one-fourth miles West of Rensselaer, on the South Side of the Iroquois River.

NIAGARA GROUP, UPPER SILURIAN.

RADIATA.

| | |
|---|------------------|
| <i>Lyellia americana</i> | Edwards & Haime. |
| <i>Halysites catenulatus</i> | Linneus. |
| <i>Favosites niagarensis</i> | Hall. |
| <i>Favosites favosus</i> | Hall. |
| <i>Favosites forbesi</i> (var. <i>occidentalis</i>)..... | Hall. |
| <i>Stromatopora concentrica</i> | Owen. |

BRACHIOPODA.

| | |
|----------------------------------|----------|
| <i>Pentamerus galeatus</i> | Dalman. |
| <i>Pentamerus nysius</i> | Hall. |
| <i>Pentamerus oblongus</i> | Sowerby. |
| <i>Pentamerus knighti</i> | Sowerby. |

GASTEROPODA.

| | |
|--|-------|
| <i>Platyostoma niagarensis</i> | Hall. |
| <i>Strophostylus cyclostomus</i> | Hall. |

CEPHALOPODA.

| | |
|------------------------------------|-------|
| <i>Orthoceras crehescens</i> | Hall. |
|------------------------------------|-------|

CRUSTACEA.

| | |
|-----------------------------------|-------|
| <i>Calymene niagarensis</i> | Hall. |
| <i>Illænus ioxus</i> | Hall. |

The remains of the ancient giant animals of Indiana have been found in this county, while the bones of the buffalo, beaver and bear are common; the remains, partially decomposed, of the mastodon were found at one place, and at another those of a mammoth (or elephant). These, in gathering the tall grasses from the swamps, had mired and left their bones in a preserving bed of peat.

The remains of the Mound Building race are not plentiful in this county. Spears, arrow-heads, axes and scrapers have been found, some of the former made of a glossy chert, of the peculiar form seen only in Tennessee, the latter of highly polished stone. About four miles northeast of the county seat, on the east side of the river, is a mound, the only authentic relic of the race, about ten feet high, forty feet in diameter and it contained ashes, bones and shells.

ECONOMIC GEOLOGY.

SOIL.

It will be seen from the foregoing that Jasper county contains a considerable body of highly productive lands. All the cereals and the grasses grow well in the loamy soil in the southwestern parts, and in other localities where drainage exists. The wild grasses of this county feed herds of cattle, and extensive grazing is carried on with great success.

FRUITS.

Apples, peaches, pears, and all of the staple fruits succeed well in localities protected by the presence of adjacent ponds and lakelets, and the porous nature of the sandy soil. Small fruits, plums, grapes, strawberries, blackberries, raspberries, and cranberries grow in great profusion, and are, so to speak, to the "manor" born, and afford berries of delicious flavor. This is the native home of the cranberry; and many of the ponds, swamps and water thoroughfares are perfectly adapted to the cultivation of this delicious fruit. The nature of the

plant requires that at certain seasons of the year the plantation beds must be overflowed, and at a late season the water must be drawn off by sluiceways. After the wild vegetation has been subdued, adjoining sand ridges and knolls furnish material and facilities for cheaply bedding and covering the roots of the young plants with sand free from foreign material.

Experiments in Laporte and other counties show that the cranberry, properly cultivated, may be grown successfully with large profit. It has been noted in the former Geological Report of 1873 that large plats of cranberries grow wild in Elkhart, Lagrange, Laporte and Warren counties. In the latter county the "Cranberry Pond" (page 229, Report of 1873) contained two classes of plants and berries—the "long-vine," bearing oblong, and the "short-vine," bearing sphere-shaped berries. In this locality the maximum crop of a favorable year, without any care or attention, would yield not less than 70 bushels to the acre, ranging thence, in a dry season, down to 10 bushels per acre. Good crops follow a "wet" June, or the reverse—clearly indicating the right season for flooding the beds when under cultivation. Such grounds should, with proper care, yield a profit of from \$50 to \$300 per acre, and give a greater income than can be obtained by any other production.

CLAY.

Good clay for brick and tile making is common throughout the county, as indicated by the substantial brick buildings at Rensselaer and other towns. Near the county seat a fine grade of patent pressed brick and tile are manufactured in large quantities.

BUILDING STONE AND LIME.

The conglomerate sandstone at Van Rensselaer's quarry is admirably adapted for foundation and heavy masonry; while the underlying limestones in many parts of the county furnish a good quality of material for building purposes and for burning into lime.

ROAD MATERIAL.

The cherty limestone at Rensselaer, affords an excellent quality of rock for road beds, while gravel of the best road-

making quality, is to be found along the ridges and mounds dividing the courses of the ancient Kankakee and Iroquois rivers. A reliable bed of gravel of considerable extent, lies on Thompson's farm, section 16, township 29, range 6, and another bed, though smaller in size, exists on the opposite side of the creek. These gravels with the abundant limestones about the county seat afford ample material for good roads.

IRON.

In the northern part of the county extensive deposits of bog-iron ore exist. The area of deposit, as estimated by Mr. S. P. Thompson, some time since, in townships 30, 31 and 32 north, ranges 5, 6 and 7 west, extended over about 5,700 acres. The beds are, as a rule, from one to two and a half feet below the surface, and from five to six inches thick, while in some places they were reported to be two to two and a half feet in thickness. With better shipping facilities, the digging of this ore might in the future become profitable.

MEDICINAL SPRINGS.

Near Rensselaer a number of mineral springs exist, the waters of which prove to be highly medicinal. Being sulphuretted, they are of especial value in a malarial climate. An artesian well bored close to the town to a depth of over eight hundred feet, discharges a large volume of highly sulphuretted water, which has already gained a more than local reputation for its health-giving qualities.

PETROLEUM.

Oil is present in the limestones about Rensselaer, and most of the rocks in that vicinity contain more or less bitumen (desiccated petroleum).

The fluid, however, is so diffused and so limited in quantity that it can be of no possible economic value. The artesian well at Rensselaer was sunk for the purpose of "striking oil," but the medicinal water which it yields is of more value than all the petroleum which will be found throughout the county.

FISH AND GAME.

Fish and game are very plentiful along the streams, and Jasper county is visited by large numbers of sportsmen yearly, who always go away well repaid for their time and expense. The fish are of the finest lake, as well as river varieties, while, in season, wild duck, geese, brant and other game birds swarm in the ponds and marshes and along the streams.

THANKS.

Thanks are hereby tendered to Dr. Loughridge for assistance and specimens; to Prof. W. De M. Hooper for donations to the Museum, and to Hon. R. S. Dwiggin, Wash. L. Grant, and the citizens generally for assistance and courtesies.

TABLE OF ALTITUDES.

JASPER AND NEWTON COUNTIES.

Line of Logansport, Peoria & Warsaw Railroad.

| | Feet Above Ocean. |
|--|-------------------|
| Indianapolis Union Depot..... | 721.20 |
| State Line between Indiana and Illinois..... | 680.00 |
| Kentland Station..... | 684.00 |
| Goodland Station..... | 721.00 |
| Remington Station..... | 735.00 |
| Wolcott Station..... | 718.00 |
| Reynolds..... | 695.00 |
| Surface Water of Tippecanoe..... | 605.00 |
| Monticello Station..... | 675.00 |
| Logansport Station..... | 596.00 |

Line of Wabash & Erie Canal.

| | |
|--|--------|
| Toledo, average level Lake Erie..... | 573.00 |
| Fort Wayne, summit level..... | 767.00 |
| Wabash, Court House square..... | 730.00 |
| Peru, Court House square..... | 657.00 |
| Mouth of Eel River, Logansport..... | 583.00 |
| Low Water Wabash River, at Delphi, below Pittsburgh Dam | 526.00 |
| Low Water Wabash River, at Lafayette..... | 506.00 |
| Low Water Wabash River, at Terre Haute..... | 451.00 |
| Low Water Wabash River, at Evansville..... | 326.00 |

*Water Level Line of Kankakee River—Prof. J. L. Campbell's
Kankakee Survey.*

Feet Above Ocean.

| | |
|---|--------|
| South Bend, near head of river..... | 726.00 |
| Mouth of Mill Creek, crossing of P., Ft. W. & C. R. R. | 682.10 |
| English Lake, outlet..... | 667.10 |
| Dunn's Bridge, Jasper county..... | 663.70 |
| San Pierre, Pulaski county..... | 705.00 |
| “Grand Junction,” 1¼ miles east of Raum's Bridge, Jasper county..... | 660.50 |
| Hebron, Porter county..... | 676.00 |
| Rose Lawn, C. & I. Air Line R. R., Newton county..... | 675.00 |
| Bridge of C. & I. Air Line R. R., Newton county..... | 635.70 |
| Blue Grass Bridge, Newton county..... | 632.20 |
| Lowell, Lake county..... | 665.00 |
| State Line, Indiana and Illinois..... | 624.30 |
| Momence, Ill..... | 613.50 |

Line of Louisville, New Albany & Chicago Railroad.

| | |
|---|--------|
| Track at Lafayette..... | 553.00 |
| Water surface Wabash river at L., N. A. & C. Ry. bridge..... | 511.00 |
| Track at Chalmers..... | 710.00 |
| Water surface, Kankakee river..... | 674.00 |
| Track at Westville..... | 789.00 |
| Track at Michigan City..... | 601.00 |
| Surface of Lake Michigan..... | 585.00 |