The Rock River Country of Northern Illinois
By Deette Rolfe
THE ROCK RIVER COUNTRY
OF NORTHERN ILLINOIS
The Hintz Studio, Dixon

Green Rock
THE ROCK RIVER COUNTRY OF NORTHERN ILLINOIS

By

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FOREWORD

There are many ways of enjoying the beauties of Nature. One is the simple delight of the eye in contour and coloring. A cloud-capped mountain, a wooded hillside, a moss-covered cliff, a misty waterfall, a scarlet-leaved oak—all of these make very direct appeal to the eye and give a distinct sense of pleasure. Often they lift one—for the moment at least—to a higher plane of life.

To this appeal to the eye and the emotions, there may be added an intellectual appeal, to be gained through some understanding of the many and varied forces of Nature which have entered into the making of the landscape, and of the way in which they have worked through the ages. The result is increased enjoyment and appreciation of the scenery. Intelligent appreciation always comes as a result of understanding—whether it be appreciation of one's fellow-men and their work, appreciation of music or art, or appreciation of the beauties of Nature.
In Illinois, there are many places worthy of such appreciative enjoyment, and they represent a large number of different types of landscape beauty. Some of these localities are well-known, and have been set aside as state, county, or city parks and preserves. Others are known to relatively few people and are owned privately. Some of the places are of considerable extent; others are in miniature—like clear-cut cameos. All of them should be treasured, and their beauty should be regarded as a heritage to be preserved and handed down from generation to generation.

It is with the hope of stimulating a more general interest in these areas of scenic value in Illinois, a greater appreciation of them, and a more widespread desire to safeguard and preserve them that this little bulletin concerning one such region is written. The area along Rock River between Beloit and Dixon—commonly known as the Rock River country—is a region of great natural charm, presenting as it does a rare succession of places of unusual and varied beauty. All along the seventy-five-mile stretch of river are pictures which delight the eye, engage the interest and repay in bounteous measure every effort on the part of man to understand the forces that have operated in the making of the landscape.

To the many persons who have contributed in material and time, as well as to the bulletins of the Illinois State Geological Survey and other publications which have been consulted, I wish to acknowledge my very great indebtedness. I am also under particular obligation to Dr. M. M. Leighton, Chief of the Survey, for the opportunity and cooperation which have made possible this publication, and to Mr. A. G. Eldredge of the University of Illinois for the photograph on the cover.

Deette Rolfe.
Rising in a group of small glacial lakes in south-central Wisconsin, a picturesque, island-dotted river—the Rock—flows south in Illinois for about forty-five miles, and then turning to the southwest just below Camp Grant, swings in a wide curve across the northwestern part of the State to join the Mississippi at Rock Island. The river varies in normal width from five hundred to eight hundred feet, and runs for the most part over a gravelly bottom, sometimes in a wide, open valley, but at other times with high, wooded, and often rocky bluffs or precipitous cliffs closing in to form a gorge-like channel.
Above Camp Grant\textsuperscript{1}, except for a short distance at Rockford, the valley is continuously open, and from three to four miles wide, with gently rounded bluffs sixty to a hundred feet high. The floor of the valley is mostly a fairly level terrace into which the river has cut its present winding channel forty or fifty feet deep. Here and there, the stream flows close to one of the bluffs, and the terrace stretches off to the opposite bluff on the horizon. In places, the level expanse is broken by secondary terraces, or by little wet-weather streams; and here and there are patches of woodland, fragrant in the spring with the blossoms of the wild plum, crab, and locust. On the terrace have been built the towns of South Beloit, Rockton, Roscoe, a large part of the industrial section of Rockford, and Camp Grant.

Below Camp Grant, where the river swings to the southwest, there is, over much of the distance to Dixon, little more than a suggestion of a terrace. For the most part, the river valley is narrow and its sides are steep—often precipitous. High, almost perpendicular cliffs alternate with low rounded hills, and narrow gorges and deep ravines with open valleys. The smooth slope of the rounded hills; the ruggedness of the rock outcrops; the fantastic and castle-like forms which the towering cliffs assume; the striking and unusual coloring of the outcropping rocks, cream or white as they are, and marked here and there with bands or splotches of bright orange, yellow, brown, blue, and green; the myriad of wooded islands with their innumerable suggestions of romance and mystery; the windings of the river, which continu-

\textsuperscript{1} Only that portion of the Rock River Valley between the Illinois-Wisconsin State line and Dixon is considered in this publication. For the convenience of the reader, a map of the region is given on pages 30 and 31.
ally draw out one's imagination; the dark forest cover; the profusion and great variety of other plant growth; the occasional breaks in the bluff line where tributary streams enter—all these combine to form a varied land-
View from Black Hawk Statue
scape, at once restful and inspiring, and appealing to one's every mood and whim. It is little wonder that this portion of Rock River should long ago have been designated as the "Hudson of the West". It is a region which constantly stimulates interest and imagination.

The towns along this portion of the river are variously located. Byron, center of the Rock River clam-shell industry, is situated on a broadened bit of river terrace; Oregon is set in a hill-surrounded basin; the peaceful, New England-like village of Grand Detour, long known as
an artists' paradise, is almost encircled by the river which makes a great loop at that point; and Dixon with its inviting gardens lies on both terrace and bluffs. Two and a half miles north of Dixon on the west side of the river is Lowell Park—a two hundred-acre tract of woodland, which had been kept in a practically wild state for the half century before its presentation to the city in 1907. No one
can estimate the value of such a piece of property to a town.

For the most part, the upland of the Rock River country is covered with glacial drift, and is gently rolling. It is largely farm land, with a number of country villages
and hamlets, many of which are located on streams tributary to the Rock. The glacial drift varies in thickness from a few feet to more than a hundred feet. Where it is thin, even small streams have reached the underlying rock, here and there exposing a picturesque rock wall in
an otherwise open drift valley. The tributaries of the Rock offer large variety of scenic interest, the bayous of the Pecatonica, for example, contrasting sharply with the wooded gorge of the Kishwaukee or the vine-festooned walls of Pine Creek.

Nine miles west of Oregon is the White Pine Woods, recently made into a State park after more than a quarter of a century of effort on the part of persons interested in the preservation of the woods. This forest contains the last important stand of native white pine in the State. Formerly, the white pine was common throughout a considerable portion of the Rock River country, but now there remain only this woods and the isolated pine trees or groups of pines which here and there crown the hills.
There are few trees more beautiful than the white pine. Straight and tall, with outstretched branches, it adds dignity to its surroundings; viewed against the night sky, it forms a striking silhouette.

In Winnebago County, the northernmost of the Rock River counties, there are seven forest preserves. Winne-
bago was the second county in the State to create such preserves, Cook County having been first. Under the laws of Illinois, any county or other geographic unit may organize itself into a forest preserve district, with power to acquire wooded land by gift, or by purchase, with money raised by taxation or the issuing of bonds, and to create forest preserves "for the purpose of protecting and preserving the flora, fauna, and scenic beauties within such district . . . for . . . the education, pleasure and recreation of the public".

Nothing can take the place of hills and valleys, woods and flowers, open places, streams and lakes in the life of man. Illinois now has laws designed to protect certain wild flowers which are fast disappearing from the State—the blood-root, lady-slipper, columbine, trillium, and gentian, all of which are still found in the Rock River country. Without protective legislation, many a plant and bird might be totally exterminated within relatively few years, just as have been the passenger pigeons. Less than seventy-five years ago, these birds commonly flew over the Rock River valley in flocks a mile and more long; now they are unknown anywhere in the world.

The unusual character of the Rock River region has always attracted man. Long before it was open to settlement, persons who crossed the area in journeying between either Chicago or Peoria and the lead mines at Galena, in the northwestern corner of the State, made frequent comment upon the natural beauty and charm of the country. That it was so long closed to settlement was due solely to the fact that it was the home of the Indian. For at least a decade after Illinois was admitted to the Union, the red men paddled their canoes unmolested up and down Rock River, in and out among the willow-covered islands, hunt-
ing and trapping, and bartering their furs to the occasional white trader who came their way, or carrying them to the old fur post located near the site of Grand Detour. The Indians loved the river, and left it only under compulsion. Not until after the close of the Black Hawk War in 1832 was the area really open to general settlement by white men. Then it was with the charge of the conquered Indian
leader, Black Hawk—"The Rock River was a beautiful country . . . I loved it . . . I fought for it . . . It is now yours. Keep it as we did."

One does not wonder that Black Hawk's name has caught the imagination until now it is found all over the Rock River valley—in town and country, on roadside stand and in city park; nor is it strange that the great Indian statue erected on the brow of the Oregon hills by Lorado Taft should have come to be commonly known as "Black Hawk". This statue, designed to portray all that was best and most noble in the Indian race, imparts to those who see it something of that same quietness of spirit which must have come to Black Hawk and other Indians as they stood on the bluff—perhaps just at sunset—and looked down over the valley of their loved river. Somehow, one can not but believe that Black Hawk's unconquerable spirit will always play its part in the preservation of the natural beauty of the land he loved so well.

Much of the unusual character of the region is the direct result of its geological history. A natural curiosity regarding the features of the landscape seems inherent in man. Even the most primitive races have their ways of
accounting for the unusual in scenery, often developing very ingenious explanations. The North American Indian used to resort to tales of a miraculous order which recounted impossible happenings, many of them performed in the twinkling of an eye. He had no conception of time, nor of geological processes. Present-day investigators have shown, however, that geologic time is immeasurably and inconceivably long. Compared to geologic eras, our centuries are but a moment.

The geological story of the Rock River country is based upon careful and detailed studies which geologists have been making for years on the surface of the land and the rocks beneath the surface, not only in the immediate Rock River region, but also in other places perhaps far distant from it. What was learned in one place has been fitted into what was discovered in another, much as irregularly shaped blocks may be fitted together, until at last a series of patterns or pictures has appeared—indistinct in places, it may be, and with some parts missing, but still sufficient for the outlines of a tale which recounts many of the changes through which the region has passed.

*Courtesy Mr. F. G. Taylor*

Springtime on one of the islands
THE GEOLOGIC STORY

The Rock River story opens with a series of pictures which can be seen only through the mind's eye. By means of them, one can turn back countless ages to the time when the sediments which were to form the rock strata of the region were being laid down, and can visualize the long, slow processes by which the rocks were formed.

There are three kinds of rock in the Rock River country—sandstone, best known in the striking white cliffs which guard the river for miles in the Oregon-Grand Detour region; limestone, which crowns many of the sandstone hills and which in other places, as at the Black Hawk monument, forms almost the entire bluff; and shale, which forms thin layers between and interlayered
with the sandstone and limestone. These rocks are many millions of years old, and are all made up of particles of ancient sediment of one kind or another, closely packed together, and more or less firmly cemented. On this account, they are called sedimentary rocks. The sandstone is composed primarily of grains of sand; the limestone, chiefly of bits of shell and other lime or magnesia sediments; and the shale, principally of particles of clay.

These materials were deposited very largely under water—in widespread seas which during much of Paleozoic time (see table on page 29) submerged all of northern Illinois. Sometimes this sea was fairly deep; at other times its waters were so shallow that they barely covered the surface or parts of it.

The clay and sand came from other, older rocks in the highlands of Canada—rocks which through the ages had been worn down and decomposed or broken into tiny bits, being carried into the sea by streams or blown in by winds, and often sorted by waves and currents.

Lime came from older rocks, too; but because it was so easily dissolved by percolating waters, it entered the sea in solution. At periods when the waters of the sea were clear, and other conditions were favorable, there was much plant and animal life in the sea. There were times when its waters fairly teemed with little animals which secreted shells or skeletons from the lime and other mineral matter dissolved in the sea water. As these animals died, their hard parts were deposited as sediment on the bottom of the sea. Although most of the shells and skeletons were broken to bits or ground to powder by the action of the waves and currents, great numbers of them escaped destruction, and still remain imbedded as fossils in the rock, recording the character of the life in those ancient seas.
These processes are exactly what are going on today all over the earth. Rocks are being slowly weathered and worn away; and pebbles, sand, and soil, as well as mineral matter in solution, are being carried to the oceans, or to inland seas or lakes, and deposited there. In many places, as along coral reefs, a marked accumulation of the hard parts of animals is taking place. Ultimately, maybe some millions of years hence, this sediment now being deposited may—probably will—have been converted into rock.

The rocks of the Rock River country all tend to have a banded or stratified appearance, which gives variety to the outcrops, and is in large measure responsible for many interesting effects of light and shade, as well as for pleasing variations in tint and color. This is characteristic of sedimentary rocks everywhere. Because the sediment of which the rocks were formed was deposited layer upon
layer, any changes which occurred from time to time in the kind of sediment, its purity, the size of its particles, the conditions under which they were laid down, or the kind of material which cements the particles together, are recorded in the banding of the rocks. Often marked changes of this sort are recorded at frequent intervals, and the rock is divided into thin, clearly defined layers, perhaps not more than an inch or so thick. Where such changes took place at longer intervals, or where accumulation was more rapid, the beds are thicker; and where the changes were less marked, one kind of rock grades into another with no definite line between the two but only a soft shading.

Differences in the character of the layers, and the greater ease with which ground water moves along bedding planes between them, or follows vertical cracks, have resulted in uneven weathering of the exposed rock. What in places might otherwise be a forbiddingly wall-like surface is thus broken up and often interestingly sculptured. Bits of shelving rock, for instance, add immeasurable charm, particularly if covered with moss or ferns or supporting a woody growth. Turreted rock masses, like those of the Oregon-Grand Detour region, immediately engage one's attention. The Indians believed that these were the abode of invisible spirits which watched over their loved river. Strange and fantastic rock forms, such as that of the "frog rock" below Oregon, add another element of interest, and they,
too, must have been productive of innumerable Indian legends.

Rocks are classified according to age as well as composition, and rock strata have been grouped in the order of their deposition from the youngest down to the oldest. Reference to a geologic chart, such as the one which follows, gives a general idea of the relative age of the rocks in a given region.

**Geologic Chart for the Rock River Country**

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On Franklin Creek
The Rock River country bears the distinction of having outcrops of the oldest formations known to come to the surface anywhere in Illinois. The New Richmond sandstone, which outcrops in a narrowed portion of the valley of Franklin Creek four miles east of Dixon, has for some time been regarded as the oldest exposed formation in the State. Recently, however, rocks more ancient than the New Richmond have been discovered along Rock River east of Oregon. Some of these may prove to be as old as the Cambrian.

Lying above the New Richmond in the Franklin Creek gorge, and forming the upper portions of its vine-festooned walls, is the Shakopee limestone or dolomite interspersed with bits of vari-colored shale. The surface of the rock is deeply pitted in places, making dark shadows in the gorge walls.

Next younger than the Shakopee, in the Rock River country, is the St. Peter sandstone of the Oregon-Grand Detour region. This is the most striking of the Rock River formations, and in many respects the most interesting. Although it underlies practically the whole State, there are only a few places where the St. Peter comes to the surface, the other important outcrop areas being located along Illinois River, in the Starved Rock region near Ottawa, on the lower Fox and along the Mississippi in Calhoun County.

The St. Peter is composed of grains of almost pure quartz, loosely cemented. Usually sand contains grains of many different hard materials, as it often results from the disintegration of complex rock masses. The St. Peter

1 This outcrop was discovered by Dr. Arthur Bevan of the University of Illinois while making a detailed study of the Oregon quadrangle for the Illinois State Geological Survey. This advance statement is made with his permission.
sand, however, must have been subjected to prolonged chemical weathering and thorough sorting and working over—first by water which removed all the more soluble portions and many of the lighter-weight grains, and then by wind action, which ground to powder and carried away bits of softer mineral—until there were left only the hard, frosted, pitted grains of quartz to be carried into the Illinois sea during St. Peter time.

The bond which holds the grains in the St. Peter sandstone together is so loose that they are easily separated by rubbing bits of the rock between one's fingers. Sometimes a piece of rock seems almost to fall apart in one's hand. On the cliff surfaces, however, the material is hardened into a thin crust by mineral matter deposited as a result of the slight but constant evaporation of moisture from the exposed rock. This crust helps to protect the rock from the ravages of the weather. In spite of such protection, however, there are many places where the surface is deeply and fantastically pitted.

The sand grains themselves are pure white; but the sandstone cliffs present a striking variety of color—soft cream colors, yellow, burnt-orange, reddish-brown, gray, blue, and green. This is because many of the sand grains are coated with thin films of clay or iron oxide or other colored mineral substance. Often this material also fills many of the spaces between the grains. Small amounts of light-colored clay give the cream and yellowish tints which predominate in the rock.

The deeper-colored, rusty and reddish-brown bands and streaks are mostly the result of a cement formed of iron compounds, deposited by iron-bearing waters which circulated through certain layers of the sand. The iron cement forms a harder, firmer rock, which here and there
stands out as ridges or ribs projecting from the softer, lighter-colored portions of the cliff surfaces. In places, these ribs assume forms which suggest giant overlapping lichens, or bits of sculpture, and add greatly to the interest and picturesqueness of the rocks.

The lichen-form is particularly marked on Castle Rock, two miles below Oregon. This is a high, detached sandstone hill, standing between the cliffs and the water’s edge. It is little wooded; paths lead up it, and from its summit are entrancing views of the island-dotted river.

The narrow greenish and bluish bands which permeate the sandstone owe their coloring to the fact that at times a great deal of decaying organic matter was deposited along with the clay. The two substances reacted upon each other in such a way as to form the so-called
“lower” compounds of iron, which range in color from green to blue. These compounds coat many of the sand grains and so color the rock. At Green Rock, a mile below Grand Detour, the upper twenty-two feet of a hundred-foot sandstone cliff is composed very largely of this green St. Peter. The location of Green Rock at a bend in the river is such as to offer from its crest a sweeping view of unusual charm.

The St. Peter is of a good deal of economic importance. The ease with which it is quarried from the cliff surface and freed from the clay by washing, and the high purity of the washed sand, combine to make it a valuable source of material for the manufacture of high-grade glass, and an important glass-sand industry has been de-
veloped on the outskirts of Oregon. The St. Peter is also used in making steel castings, in the manufacture of pottery and porcelain, as engine sand, as an abrasive, as a filler for soap, in tooth-paste, in sand filters, and for many other purposes.

The presence of the St. Peter cliffs along Rock River was made possible by low earth-folds or anticlines, two of which crossed each other in the Oregon region. There they pushed the St. Peter up into a somewhat oval dome, from the crest of which the rock strata sloped away in every direction. Erosion started earlier on the dome than in adjoining regions, and was more rapid. Eventually the streams cut into its crest in such a way as to expose the St. Peter, which because of its loosely cemented character was eroded with comparative ease, until not only the dome itself was removed, but a great basin was cut down into the sandstone. It is in this basin, partially filled with later deposits of sand and gravel, and surrounded by rugged, outward-sloping hills, that the town of Oregon has been built. The deeply ravined and interesting Pine Rock region east of Oregon is but a part of the rim of the basin, as is also the prominent "Devil's Backbone" a mile and a half southwest of town.

Along the river for some miles on either side of the Oregon basin, the cliffs and hills show the anticlinal influence. It is not alone their height or coloring or surface
configuration which is responsible for their majestic quality. The tilting of the rock strata has had much to do with it, since any such variation from level—though so slight as to be scarcely noticeable to the casual observer—always adds a hint of grandeur.

The rock formation next younger than the St. Peter is the Glenwood. This is a thin formation, largely greenish in color, and varying from a shaly sandstone to a sandy shale or clay. The Glenwood is little known in the region because, being soft, there are few outcrops; but its presence can be traced along many a bluff by the location of small hillside springs. Sometimes these are very lovely, and their trickling waters often fall into clumps of ferns or other moisture-loving plants. It is the relative impermeability of the Glenwood to the passage of water that is responsible for the springs. The ground water moves more readily along the upper Glenwood surface than downward through the formation. Ganymede spring at
Courtesy Dr. C. S. Williamson

Ganymede Spring
the base of Eagle's Nest bluff north of Oregon is one of the best known of these springs.

Occasional springs emerge from limestone cliffs where a dense shaly bed lies immediately below a more porous one. Many of these are simply wet-weather springs, but some of them are perennial.

The light-colored Platteville-Galena formation, above the Glenwood, plays its part in adding picturesqueness to the region. Whether capping the St. Peter cliffs, where it has been weathered to alluring white turret-like forms or strange fantastic shapes; or forming the whole of other high cliffs; outcropping in rounded bluffs; or present in old quarries, its banded character and its tendency to
weather in such a way as to form vertical surfaces are everywhere evident. Particularly is this the case in the older, or Platteville portion. There, beds of marked difference follow each other in close succession, often—but not always—separated by thin layers of clay or shale. The white, turret-like rocks on top of the St. Peter cliffs are bluish when broken—so much so that they are commonly known as the "Blue" limestone. It is only the weathered surface which has a bleached appearance. The "Blue" band is sixty-five to seventy-five feet in thickness, and is made up of many narrower bands or beds, some having no hint of blueness. Another, lower member of the Platteville is so prevailingly buff in color that it is known as the "Buff" limestone. In the younger, or Galena rocks, the beds are as a whole thicker than in the Platteville, and present a more massive appearance. In general, all the rocks along the river above the McCormick Dairy Farm north of Byron are of Galena rather than Platteville.

All these many variations in the character of the rock are indicative of the changing sea conditions during the long Galena-Platteville ages, alternating between times when the waters were clear, and times when they were somewhat turbid with mud.

Some layers of the rock are filled with fossils, which often serve to emphasize its stratified character. Sponges, corals, and snail-like shells are all present. Other strata show few or no fossils. Evidently, conditions were not always equally favorable for fossil preservation.

Fossils tell a good deal about the individual forms of life in the sea and how they changed from time to time. Some of the fossil forms are not very unlike those in our seas today; but of others, we now have no counterpart.
This change in life is strikingly illustrated by the so-called *Receptaculites*, one of the most interesting of the lost forms. This fossil, commonly known as the sunflower coral, or as fossil honeycomb, occurs in two separate zones in the Galena, and seems to be peculiar to this formation. The Platteville shows no trace of the fossil, and so far as is known, no rocks deposited since Galena time in any part of the world contain the *Receptaculites*. It has therefore come to be regarded as a distinguishing mark of the Galena.

There are many places where fossil fragments are exposed in the rock surface, and where fossils in large number may be chipped out of the rock mass. The Dixon public library contains an unusually fine collection of fossils from the Rock River country.

Certain layers of the limestone show deep pitting on their weathered faces. This is in part because of changes in composition which the rock underwent after it was deposited. These changes have increased the original porosity of the rock, and when its surface is exposed to the weather, solution cavities of considerable size develop. Rocks whose composition has been so altered are comparatively rich in magnesia, but have lost much of their fossil content. This is true of most of the Galena, and much of the Platteville. The Blue limestone, however, has not suffered such alteration, and its lower part is packed with fossils.
The fact that the Blue limestone has little magnesia makes it possible to use it in the manufacture of Portland cement. A magnesian limestone will not do for this purpose. There are only four Portland cement plants in Illinois, and one of these is situated on the river front just above Dixon, utilizing the Blue limestone and a deposit of fine earthy material, called loess, which caps the bluff at that point.

The other layers of the Platteville and the Galena are valuable for road metal, agricultural limestone, and formerly were much used for building stone. In the northwestern corner of the State the Galena bears lead ore.

The Galena is the youngest of the rock formations known north of Dixon in the immediate vicinity of Rock River. Twelve to fifteen miles on either side of the river are remnants of a shale, the Maquoketa, lying on top of the Galena, and still farther away is the Niagaran limestone. It is believed that both of these rocks, and perhaps others of still younger age, may once have covered most or all of the Rock River country.

About the close of Paleozoic time, the region became permanent dry land, and was never again beneath the waters of the sea. Rains fell, as they do today, and some of the water soaked into the rock and some ran off the surface; the heat of the sun and the cold of frost produced unequal expansion and contraction of the rock; dust-laden winds blew hard particles against the rock surface; and acids from decaying plant and animal substances etched the rock and increased the solvent power of percolating waters—all causing the rock surface to become softened and loosened until finally it was eroded and carried away by streams. For ages upon ages these processes continued, just as they are being carried on everywhere today. Great
thicknesses of the rock were removed entirely—probably several hundreds of feet, and enormous valleys were carved out in the earth's surface. There is considerable evidence that the region as a whole was finally worn down to nearly level—peneplained, as it is called. Later the land was uplifted, and the streams rejuvenated, or set to deepening their valleys again. This sort of thing may have occurred more than once, and the land may have passed through several cycles of erosion, each cycle repeating more or less imperfectly the surface changes of perhaps a million years before. It was during one of these cycles that the St. Peter dome at Oregon was beveled and the sandstone exposed. Then the region was uplifted and the Oregon basin was cut.

It is known that the Old Rock River of the last cycle occupied a valley 400 or more feet deep, and from three to four miles across. The widely separated bluffs of the present valley north of Camp Grant mark the bluff lines of the old valley. Below Camp Grant, the Old Rock River did not turn to the southwest, as does the present river but continued almost straight south until it emptied into the Old Illinois not far from the site of Hennepin. This lower portion of the Old Rock River valley has been traced by means of borings made in the glacial drift, which filled and obliterated it.

The Old Rock River had a number of large tributaries, some of which have also been traced by borings, and are indicated on Map A, page 47. These tributaries formed a drainage pattern which below Camp Grant was quite different from that which the present streams make. The Old Leaf, for instance, emptied into the Old Rock just above the site of Davis Junction; the Kishwaukee, near Esmond; and the Kyte below Rochelle. Pine Creek,
Courtesy Mr. A. G. Eldredge

Pine Creek
After Leverett, Leighton, and Knapp

Map showing changes in the course of Rock River

the lovely little stream which flows through the Pine Woods State Park, was not then a tributary of the Rock, but instead flowed off to the southwest, and had its outlet in the Mississippi, at a point, however, far east of the present course of the Father of Waters. The whole landscape of the Rock River country of that time—sometimes said to be a million years ago—was thus strikingly different from that of the present.

Then came the glacial period, with its marked changes in climate. Up in Canada the heavy snows of one winter did not melt away before those of the next year began to fall. Year after year and century after century this went on until there accumulated enormous masses of snow and ice, which finally assumed glacial motion and spread out over nearly all of Canada and much of the northern part of the United States. As the glacier advanced it scoured the soil from the bedrock, tore off pieces of the rock itself, and ground them to powder, or carried them along as
great rock masses, boulders, pebbles, or grains of sand and clay. When the ice melted away, this detritus was left, filling the valleys, wholly or in part, and mantling the uplands. Here and there the material was heaped up in long ridges, or deposited in hills.

The glacial period was not marked by a single glacial advance, however. At least five separate times, ice sheets pushed their way into the Mississippi Valley region. Between these advances of the glacier there were long periods free from ice, during which drainage became reestablished, vegetation grew luxuriantly, and parts of the country were forested. Bits of wood and half-decayed tree trunks have been found in a number of places between two distinct coverings of glacial drift. The Rock River country bears evidence of having been wholly covered by ice once, and partially covered another time, and of having received material washed in from other ice-sheets which did not themselves actually enter the area.

The first advance of the ice into the Rock River country of which there is positive record was the Illinoian glacier (see table on p. 29), which covered the whole area and extended down to the latitude of the Ozarks in southern Illinois. The vast quantities of detritus which were left when the ice melted disarranged the drainage system over a large part of the Rock River area, completely filling the Old Rock valley below the site of Davis Junction, and making it necessary for the Upper Rock to seek a new outlet. In so doing, its waters usurped portions of old tributary valleys, cutting their way from one to another wherever divides were lowest.

The valley to be usurped first was that of the lower portion of the Old Leaf, which emptied into the Rock just above the point where the channel became closed.
The waters accumulated rapidly in the Leaf basin, spreading out and forming a broad, deep lake, which finally found an outlet for itself across the divide to the southwest, and into the basin of the Old Kyte. The Kyte basin, in turn, became converted into another lake, whose waters found their outlet through the divide lying between it and what is believed to have been one of the tributaries of the East Branch of the Old Pine Creek. Previously, this branch had united with the West Branch to form the main Pine Creek at a point about two miles southwest of the site of Grand Detour. Near the close of the Illinoian glacial epoch, however, a long ridge of sand and gravel, known as the Grand Detour esker, was deposited by a subglacial stream across the East Branch just below Grand Detour. This definitely closed the channel of the East Branch, and deflected its waters in such a way that they made a great loop to the north and joined the West Branch of the creek three or four miles farther upstream than they had done. Something like six miles was thus added to the course of the new Rock River, and at the same time Grand Detour's attractive setting was made possible.

Gradually, the outlets through the divides were lowered, and the ponded waters drained off, until there came into being a new Rock River, whose valley below Camp Grant was composed of parts of the valleys of three other river systems—the Old Leaf, the Old Kyte, and the Old Pine—joined by relatively short links cut by the new Rock itself. (See map B, p. 47.) Remaining portions of these dismembered river systems became tributaries of the new Rock. In the case of the Kyte, its flow was reversed, so that it became a westward-flowing instead of an eastward-flowing stream.

But the present Rock River was not yet made. Other marked changes were to take place in the river channel as
the result of a subsequent glacial epoch. A lobe of the
Early Wisconsin glacier pushed its way from the east,
blocked the lower portion of that part of the valley which
the Rock had usurped from the Old Leaf, and forced the
Rock to the northwest, where it cuts its present gorge-like
channel from the Kishwaukee to the Byron headlands.
(See map C, p. 47.) The long break in the gorge, three
quarters of a mile below its beginning, tells of a preglacial
tributary of the Old Leaf probably formed by the union of
Hall and Ray creeks, across which the Rock cut. These
creeks both have bits of picturesque rock wall in their
upper reaches.

Although the Late Wisconsin glacier did not enter
the Rock River valley in Illinois, it covered the Wisconsin
portion of the valley almost down to the Illinois boundary.
Water from the melting ice-front swept into Rock River
in great quantities, and with it vast amounts of sand and
gravel, giving to the river a load greater than it could
carry. Consequently, a good deal of the material was
dropped in the river valley, building up the valley floor
layer upon layer until it had been raised many tens of feet.
Such a deposit is known as a valley train. Similar deposits
had been made by water from the Early Wisconsin and
other ice sheets. As much as 298 feet of filling is known
to exist in the southeast part of Rockford.

It is chiefly in the valley train that the Rock River
has been excavating its channel ever since. The rock
bottom of the valley is in most places still many feet below
the river channel. Where the valley is wide, the terrace
is wide; where the valley is narrow and gorge-like, there
is relatively little terrace. In many places the terrace is
broken into two or more secondary flats.
Above, Byron Headlands—below, Ray Creek
At Rockford, the river flows in a rock-bottomed channel. A sort of geologic accident occurred there. A river commonly widens its channel by undercutting first one bank and then the other, as it swings from side to side. In the course of such meandering over the valley train, Rock River happened to make a loop just where, underneath the filling, there was a great, triangular spur of rock—somewhat saddle-shaped on top—projecting from the old valley wall. While in this position, the river cut down through the filling, only to find itself imprisoned behind the higher end of the spur. (See diagram below.)

![Diagram](image)

Diagrammatic cross-section at Rockford

There it has been ever since, cutting away at its bed in solid rock, while the rest of the river is working for the most part in loose material. Black Hawk Park, one of the loveliest of Rockford's many beautiful parks, is situated on the tip of the rock spur.

Many of the tributaries of Rock River have undergone changes quite as marked as those of the main stream. The beautiful and interesting Kishwaukee gorge, for instance, came about because of practically the same situation as that which resulted in the carving of the Rock
In Black Hawk Park
Along the Kishwaukee

River gorge above Byron. The choking of the preglacial Kishwaukee valley a short distance above its mouth by Illinoian drift deposits forced the stream to the west, where it cut an outlet a mile or so south of the present gorge. Later, the Early Wisconsin ice-lobe forced the stream to abandon that channel, and the present gorge was carved.

In some tributaries, the principal changes were brought about by the deposition of the valley train in the Rock River. The Pecatonica was one such. In preglacial times, its valley was deep and wide, but like all the valleys of the region, it was partially filled with drift by the Illinoian glacier. At the time when the Late Wisconsin valley-train was being deposited in the Rock, however,
the Pecatonica received relatively little material, since only one of its tributaries, Sugar River, flowed from the north where the melting ice-front lay. As a result, the bed of the Pecatonica was not built up as much as that of Rock River, whose deposit finally blocked the mouth of the Pecatonica, and dammed back its waters until they spread out and formed a wide lake extending over all the lowland. Later, as this lake became filled with deposits of mud and other sediment, and the Rock deepened its channel, the Pecatonica River again came into existence. It has not had fall enough, however, to erode a reasonably

Portion of topographic map of Rockford quadrangle showing meandering course of Pecatonica River

straight channel for itself. Instead, it winds aimlessly over the low, silt-covered flat, which at times is gay with wild flowers. The bayous change in size and shape; and occasional willows, bending low, complete Corot-like pictures.

Stillman Creek is another stream with an interesting history. From its mouth up to the town of Stillman Valley the stream occupies that part of the Old Leaf valley which was first usurped and then abandoned by Rock River, and later filled with wash from the Early Wisconsin glacier. Still later, the Late Wisconsin valley train raised
the bed of the Rock somewhat above that of Stillman Creek, and its waters were temporarily ponded much as were those of the Pecatonica.

A good deal of the country along Stillman Creek is poorly drained and little dissected by streams. The most striking feature of the landscape is an irregularly shaped mass of low hills two to three miles long lying northwest of Stillman Valley. These hills are composed of gravel and were deposited by glacial streams just beneath the margin of the ice. It was largely because of these hills that the Rock could not return to that part of the channel from which it had been forced on the advent of the ice-lobe. Big Mound, four miles southwest of Stillman Valley, was formed in a somewhat similar way.

Thus it is that the Rock River country shows such a variety of scenery. The character of the rocks, the deformation of the rock surface, the large adjustments of the stream courses made necessary because of glaciation, and many other factors have been responsible for the fashioning of the Rock River landscape. Together, they have made of the region one of the loveliest places in Illinois—a place whose natural beauty should be so treasured and preserved that generation after generation may hand it on, repeating the spirit of Black Hawk’s admonition, “Keep it as we did”.
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NOTE TO TEACHERS

In 1917, by legislative enactment, the Geological Survey, the Natural History Survey, and the Water Survey were placed under the control of the Board of Natural Resources and Conservation, in the State Department of Registration and Education. The functions of these surveys continued as they had been for many years—gathering basic scientific data in the fields of geology, biology, and water supplies, essential to the industrial and educational development of the State. The offices and laboratories of the surveys are located at Urbana on the campus of the University of Illinois.

From time to time, reports of a technical nature are issued by the surveys, which provide a permanent source of information for agriculture, mining, engineering, and manufacturing. Recently an educational series was inaugurated, of which this number is the second, to furnish authoritative information for the schools and the general public. Suggestions from teachers are requested with a view of making this series of the greatest usefulness.

Copies of this bulletin may be secured at ten cents each by addressing The Chief, State Geological Survey, Urbana; likewise the first number, "The Story of the Geologic Making of Southern Illinois," by Stuart Weller.